



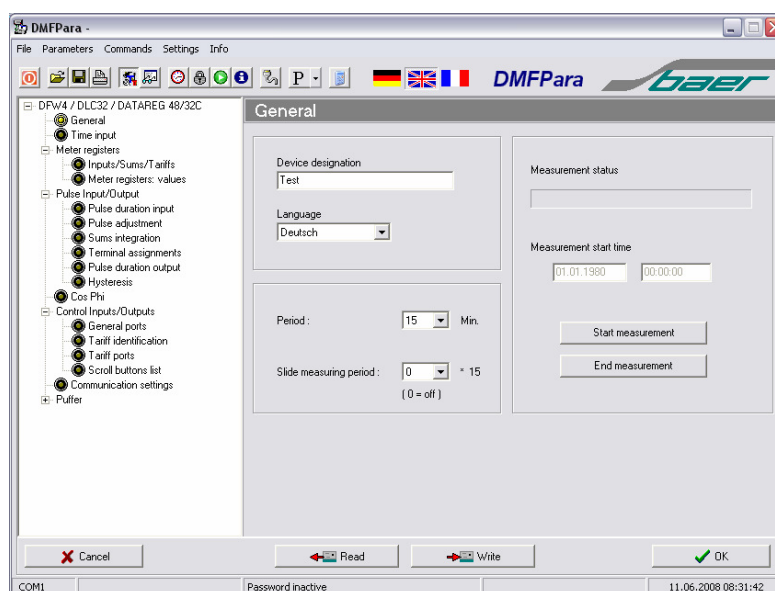
DMFPARA

(Version 2)

Parameter Setting Program

User Manual

E120509109003



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1 Introduction

1.1 The parameter setting program



The "**DMFPara**" parameter setting program can parameterize data loggers (telecounter's):

- **DataFW4 / DLC32 / DLC19 / DATAREG 48 / DATAREG 32C**

This is done over the series service interface (RS232) located on the front panel of the CPU.

The second data logger type is:

- **7FMS1 / Data Logger / DATAREG 8**

1.2 Package contents

The programming package includes one CD ROM and this user manual.



Computer:	PC, min. Intel Pentium 1500MHz or comparable PC
Main memory:	≥ 512 MB
Hard disk:	ca. 5 MB for installation and ≥ 1 MB for parameterization files
Disk drives:	Mind. CD ROM
Interfaces:	Mind. one RS232 interface (COM1 to COM255); Alternative: USB interface with converter from USB to RS232



Operating system: Microsoft Windows XP / Vista or Microsoft Windows 2000 / 2003 Server and up

Recommendation of the manufacturer: **Microsoft Windows XP**

Note: This manual describes the complete functionality of the programming software. Individual menu items may differ from this manual

2 Installation



In order to install the programming software all files on the shipped CD ROM need to be copied onto the hard disk drive of the PC or laptop computer (e.g. into the directory „DMFPARA“).

The following paragraphs explain how to install the programming software on a computer where it was previously not installed and no such directory exists.

Procedure (for experienced system users only):

1. Insert the CD into the CD ROM drive
2. Start the MS Windows Explorer and select the root folder of the drive on which the programming software shall be installed (click on the drive symbol on the left-hand side of the screen).
3. Create the program director, e.g.: **C:\DMFPARA** (File – New - Folder)
4. Copy all files to the directory, e.g.: **C:\DMFPARA**
5. The programming software is now installed on drive C: in the directory **C:\DMFPARA**

If you would like to be able to start the software without using the MS Windows Explorer, you can create a shortcut on the so called desktop of your computer (the desktop is what you see on the screen when no applications are running or when all applications are minimized). Move the mouse pointer to an empty area of the desktop (somewhere over the background image) and press the right hand button. From the dropdown menu select the item "New" and wait for the next dropdown menu to open. Now select "Shortcut". In the dialog that is now open, either enter the complete path to the DMFPARA software or click on "Browse" to locate the program. Now click on the button "Next" and enter a description for your shortcut. We suggest you use "DMFPARA". Now click on "Finish".

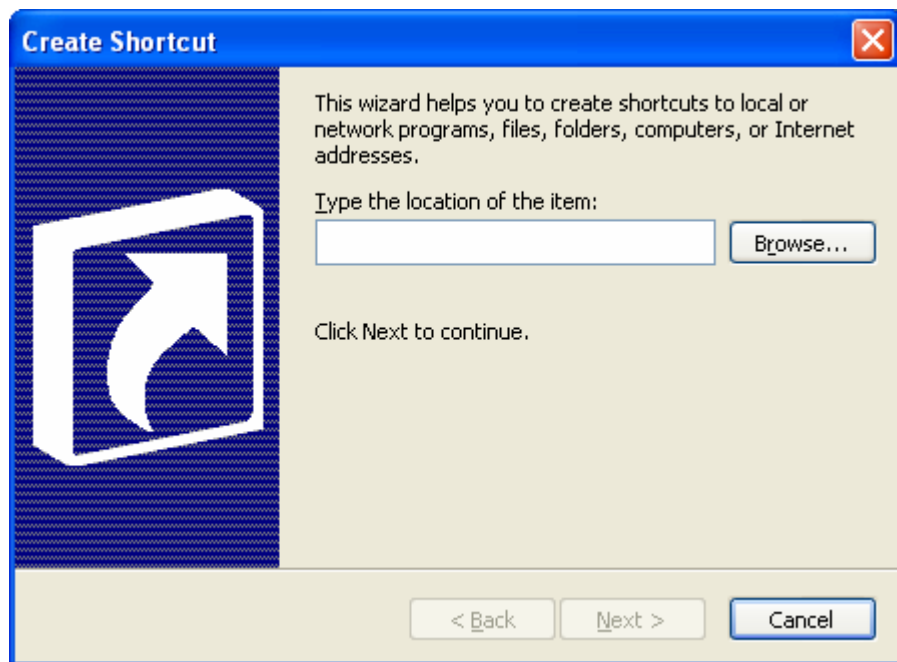


Figure 1, Creating a Shortcut

You can move this new shortcut to anywhere on the desktop by pressing the left hand button on the mouse (while the mouse pointer is over the icon) and then moving the icon while keeping the button pressed. When you release the mouse button, the icon will be dropped onto the desktop.

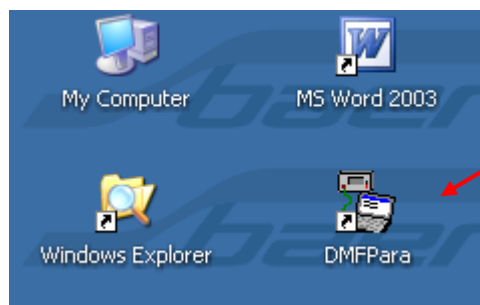


Figure 2, Icon on Desktop: DMFPara

2.1 Connection to the data logger

2.1.1. DataFW4 / DLC32 / DLC19 / DATAREG 48 / DATAREG 32C

The data logger and the PC/laptop in which the parameter setting program is installed are connected through a cable (order number: #6998). It has to be plugged into the data logger front panel and a Com-Port on the computer.

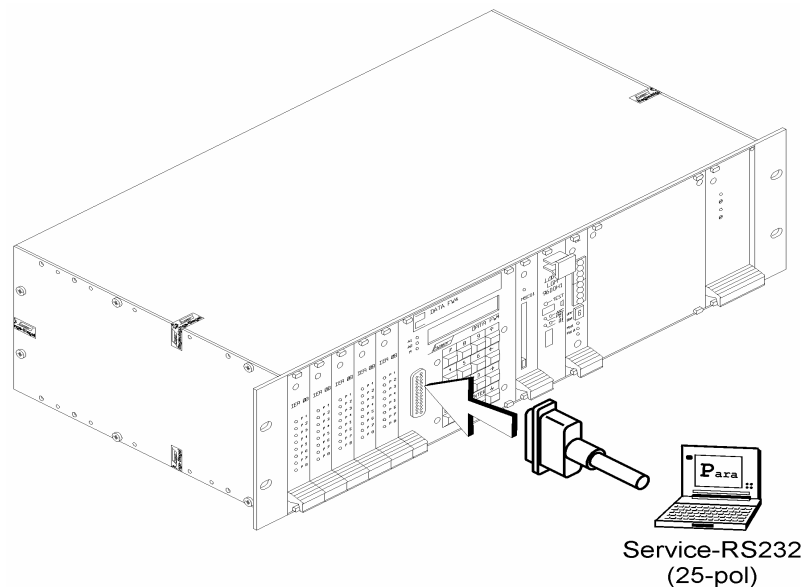


Figure 3, Connection to the data logger

Note: The connection can be made between the PC and the data logger through any free PC/laptop Com-Port (see the menu "Settings - Communications interface").

Socket type: 25 pole SUB-D plug in compliance with ISO 2110 (standard cable)

Connector pin assignment V.24 / RS232/DIN 66020

Socket function: Parameterization and read-out of the reset data through a PC.

The pin assignment of the V.24 socket on the CPU front panel is as follows:

Connection	Designation	Additional information	
2	TxD	Input	Send data
3	RxD	Output	Receive data
4	RTS	Input	Connected to 5
5	CTS	Output	Connected to 4
6	DSR	Output	Operational
7	GND		Signal-Ground
20	DTR	Input	DEE Operational

Note: This table is not valid if the data logger has a special connection assignment!

2.1.2. 7FMS1 / Data Logger / DATAREG 8

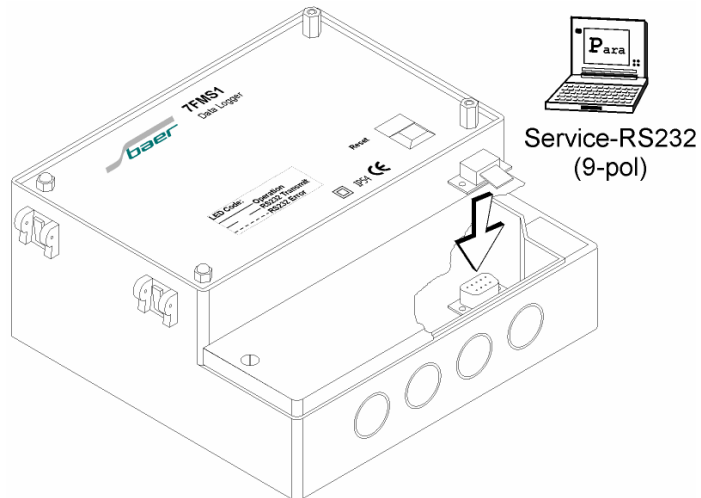


Figure 4, Connection to the data logger 7FMS1 / Data Logger

Note: The connection can be made between the PC and the data logger through any free PC/laptop Com-Port (see the menu "Settings - Communications interface").

Socket type: 9 pole SUB-D plug in compliance with ISO 2110 (cross over)

Connector pin assignment V.24 / RS232/DIN 66020

Socket function: Parameterization and read-out of the data through a PC.

The pin assignment of the connection cable (order number: #4306):

7FMS1 / Data Logger (9-pole)			PC (9-pole)		
Input/Output	Pin-Nr.		Pin-Nr.	Input/Output	Standard
Input	2	_____	3	Output	TxD (Send data)
Output	3	_____	2	Input	RxD (Receive data)
	5	_____	5		GND (Signal-Ground)
Output	7	_____	8	Input	CTS
Input	8	_____	7	Output	RTS

3 Starting the parameter settings program

The parameter setting program will be activated from MS Windows Explorer or via icon on the desktop.

After the correct installation and starting of the parameter setting program the dialog screen of the program will appear:

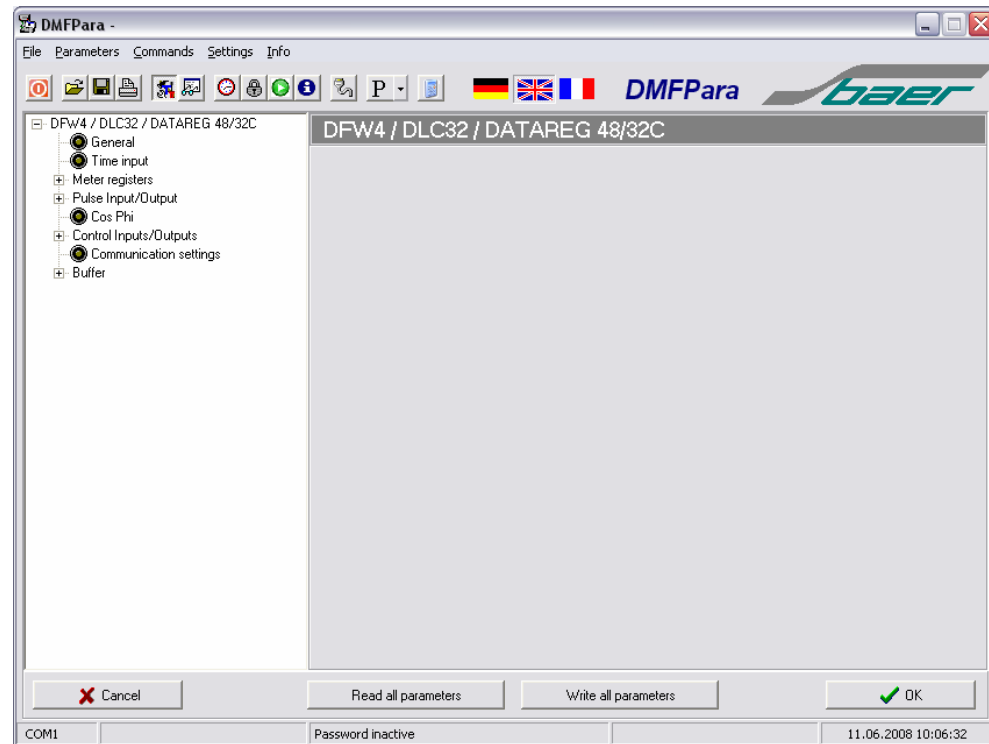


Figure 5, Starting the program: DMFPara

On the upper edge of the screen is the menu bar and on the lower edge, the status bar.

Information about parameters on the left site (node):

-  Parameters conform to factory settings
-  Activated parameter window
-  Changed parameter
-  Transmitted parameter or readout from the device

3.1 Main window

The main window contains the menu bar, the task bar and the status bar:



Figure 6, Main window

You can reach the main menu in this window either with the function key “F10”, with the “hot keys” or by clicking with the mouse pointer on any of the menu items.

The menu bar is located at the top edge of the window. In the menu bar you can call up the following main menu items by selecting them with the mouse:

1. **File:** with operating system commands: Load, Save, Save as, Print and Quit program;
2. **Parameters:** settings and read/write operation ;
3. **Commands:** for communication with the data logger;
4. **Settings:** this menu can be used to define important system parameters: Language, Com-Port, Protocol ;
5. **Info:** information about the program;

3.2 Menu bar

Menu bar:



Figure 7, Menu bar

The tool bar is located underneath the menu bar. It contains buttons with icons used for quick access to menu items. If the mouse pointer comes to rest over a button, a brief description of that button is displayed after a short period of time.



Figure 8, Brief description

	Quit program
	Load the parameter file
	Save the parameter file
	Print the parameter file
	Show parameters
	Parameter list (TXT-File)
	Set time
	Set/reset password
	Start measurement
	Stop measurement
	Read device information
	Settings for communications interface
	Change protocol between: DataFW4 / DLC32 / DLC19 / DATAREG 48 / DATAREG 32C and 7FMS1 / Data Logger / DATAREG 8
	Start calculator
	Change language

3.3 Status bar

Status bar:

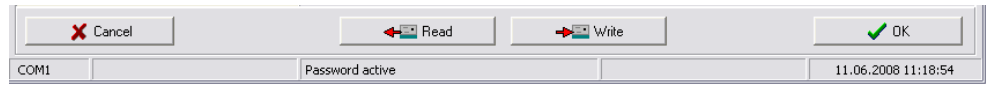


Figure 9, Status bar

Information in the status bar:

- Com-Port
- Device designation
- Status of password
- Status of measurement
- Actually time
- Progress of data reading ore writing:



Figure 10, Progress of data reading

3.4 Operation



As alternative to the mouse you can also use key combinations corresponding to the MS Windows standard. Some examples:

STRG+C	Copy
STRG+X	Cut
STRG+V	Paste
TAB	Jump to next control

Note: The above key combinations are only active in those menu items where they find meaningful application.

Select the menus

You can reach the main menu in this window either with the function key "F10", with the "hot keys" or by clicking with the mouse pointer on any of the menu items.

Set one register

In some menus you can set single register. Select one line by a click with the mouse on the left site of the line:



2	00000000	00000000	00000000	00000000	00000000
3	00000000	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000	00000000

Figure 11, Select one line



Write (send) the values to the device.

4 Menu File

***.PAR** Parameter file

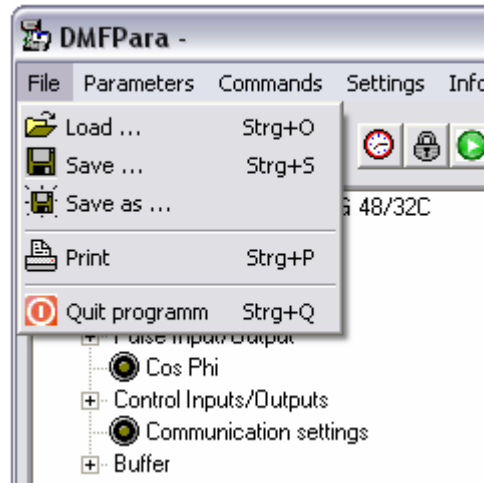


Figure 12, Menu File

4.1 Load



Opens an existing parameter file (*.PAR):

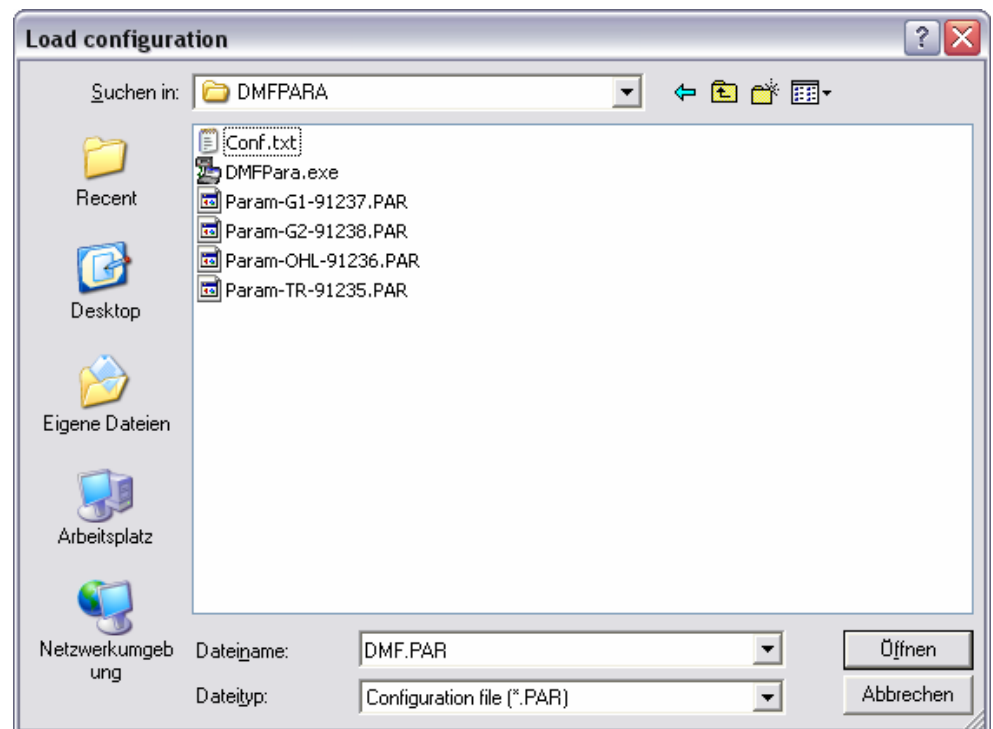


Figure 13, Load a parameter file

4.2 Save / Save as



Saves the parameters in the open parameter file

With this menu item you can save any modified parameter settings in the currently open file. If no parameter file is currently open, the menu item "Save as" will be activated.

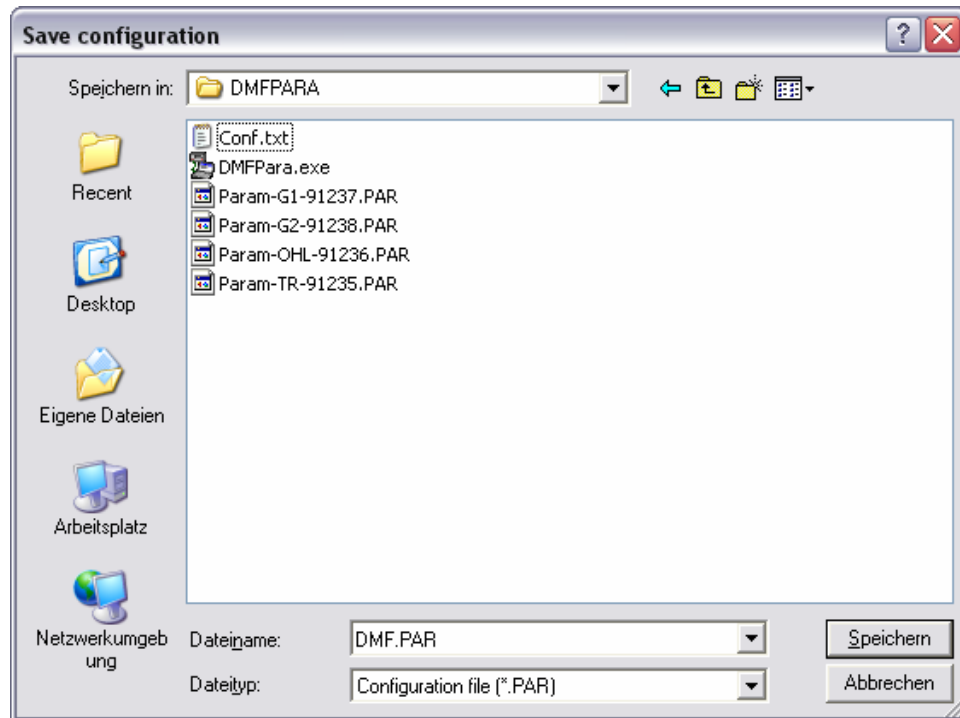


Figure 14, Save a parameter file

4.3 Print



Prints the currently open parameter file in clear text to the selected printer:

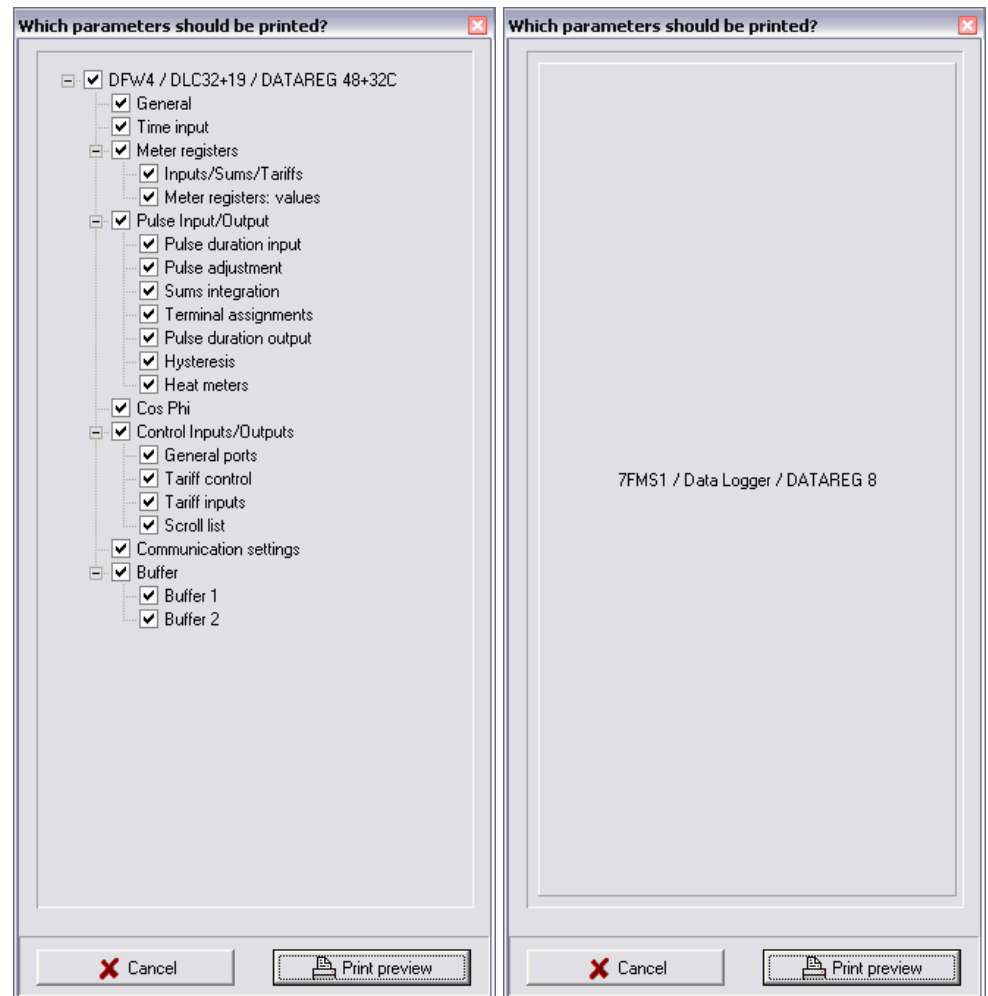


Figure 15, Print wizard

4.3.1. Print preview

Shows the currently open parameter file page by page (in the way it would be printed).

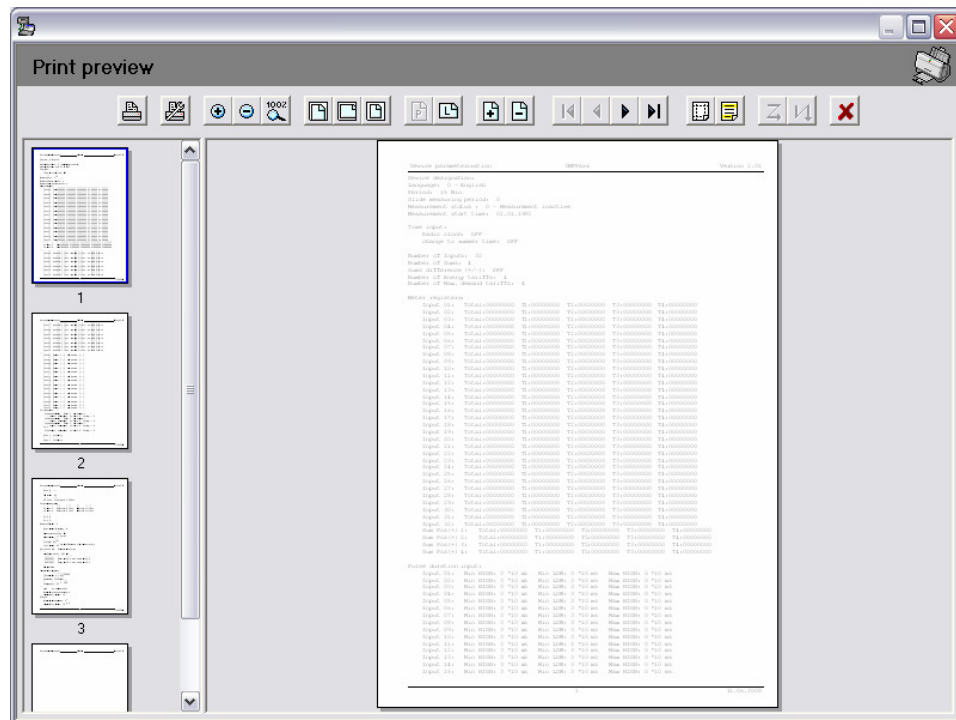


Figure 16, Print preview

In the print preview you can adjust a further range of settings:

-  Print the current graph
-  Modify printer settings (of the driver installed in the operating system)
-  Zoom in or out
-  Adjust the view to the display area.
-  Portrait or landscape
-  Increase or decrease the font size (only possible for printing onto paper)
-  Move backwards through the pages
-  Move forwards through the pages
-  Adjust the page margins
-  Set the header and footer
-  Select the page sequence
-  Cancel

4.4 Quit program

  If you want to exit the programming software, select the menu item “Exit”, click on the  button in the upper right hand corner of the main window, the  button or use the key combination “ALT” and “F4”.

If you have not saved your data by using the menu item “Save as” or “Save”, it will be lost when you exit the software.

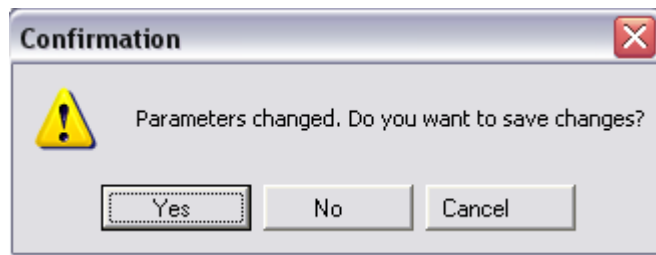


Figure 17, Save parameter file

- „Yes“-Button: for save
- „No“-Button: for don't save
- „Cancel“-Button: for break (back to the program)

Note: The actually program settings (interface, timeout, language ...) will be automatically stored in the file “DMFParaVer2.ini”.

5 Menu Parameters

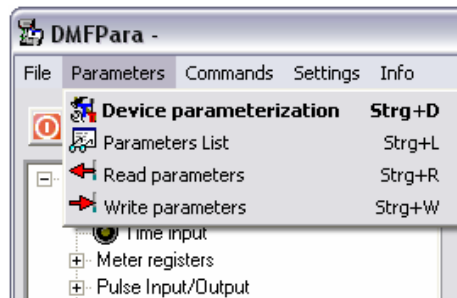


Figure 18, Menu Parameters

5.1 Device parameterization



Parameter window: on or off

5.2 Parameter list



Shows the parameter list:

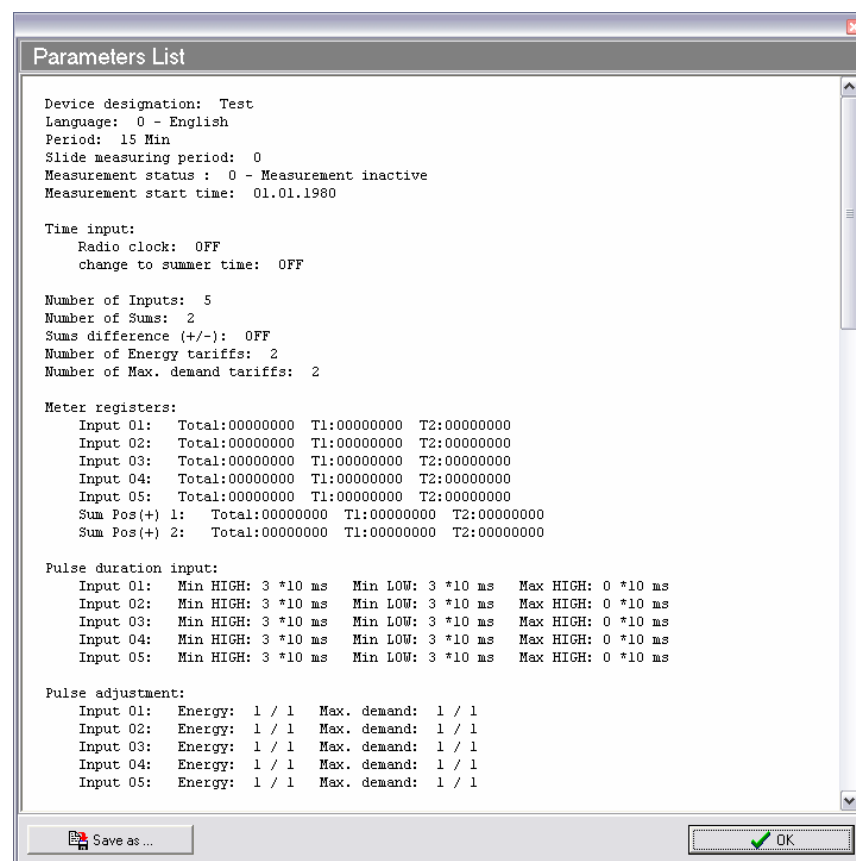


Figure 19, Parameters list

The currently open parameter file can be saved in a TXT-File.

5.3 Read parameters



Read all parameters from a connected device.

Click on the button “Read parameters” to read all active parameters from the connected device and to upload them into the programming software. Existing settings will be overwritten.

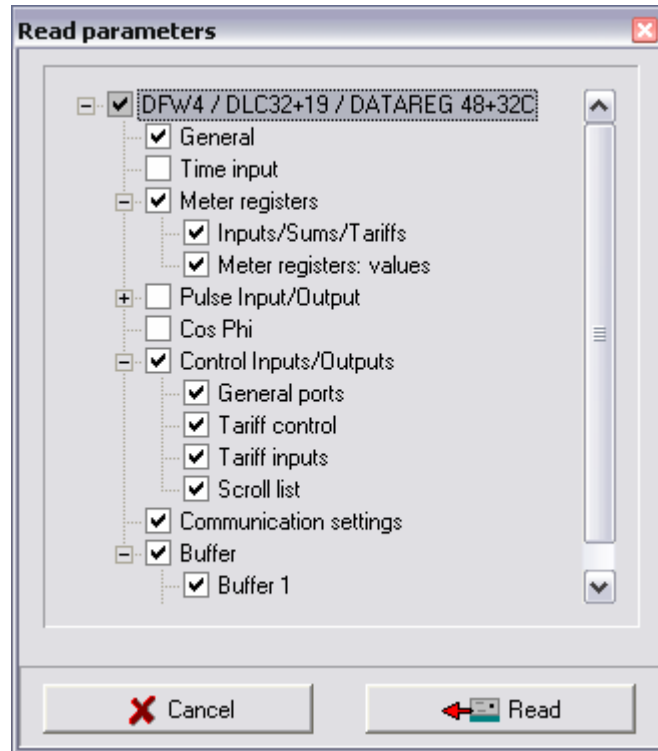


Figure 20, Read parameters

Parameters related to marked check boxes will be read from the device via the service interface.

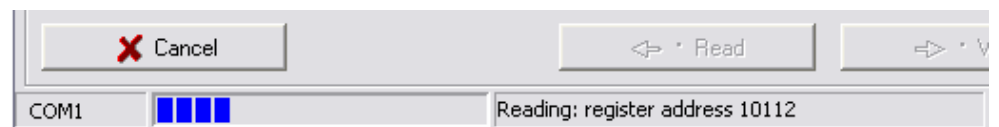


Figure 21, Progress of data reading



Readout parameter:

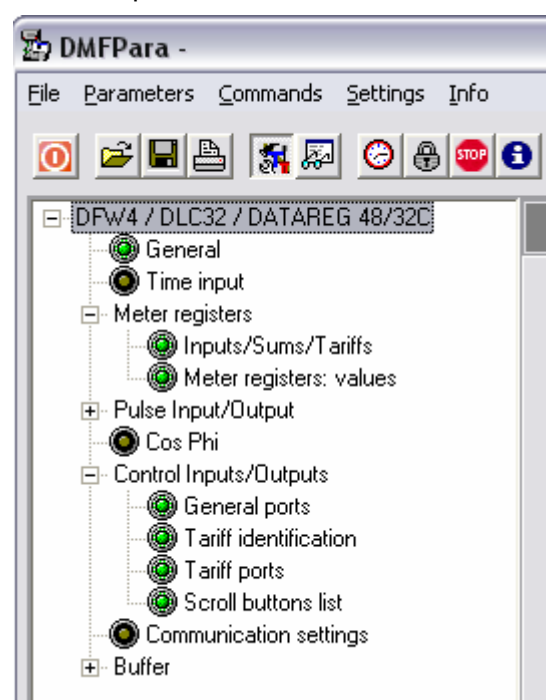


Figure 22, Readout parameter

5.4 Write parameters



You can define all the parameters for a data logger on a stationary PC and then program the device later on site by means of a laptop computer. Use this function (after having opened the relevant parameter file) to program a unit on site.

Note: You should execute a unit restart system (factory settings) in the device before programming it to new parameters.

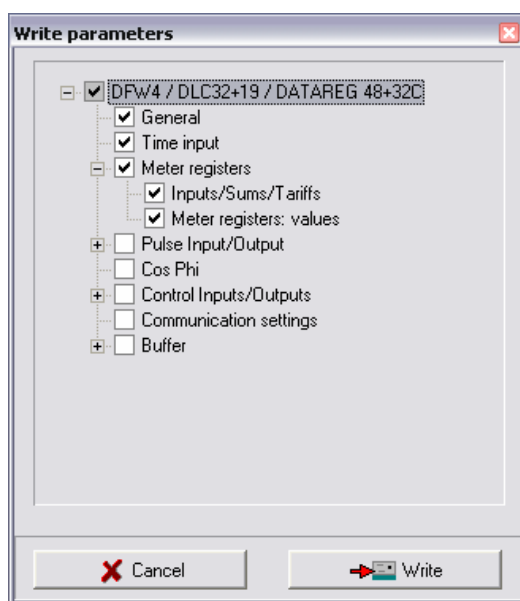


Figure 23, Write parameters

Without input of the correct password for parameterization no parameters can be transmitted to the device. Enter the password:

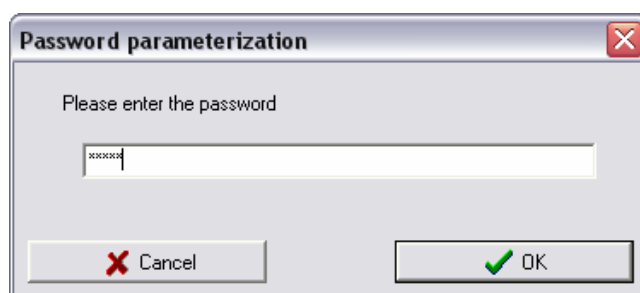


Figure 24, Password

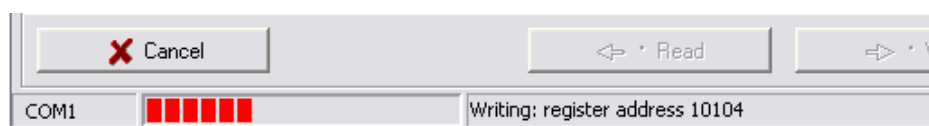


Figure 25, Progress of data transmit

Important: When these settings are complete, the measurement can be set to start through the selection of the menu "Commands – Start measurement"!

6 Menu Commands

Some commands important for maintenance.

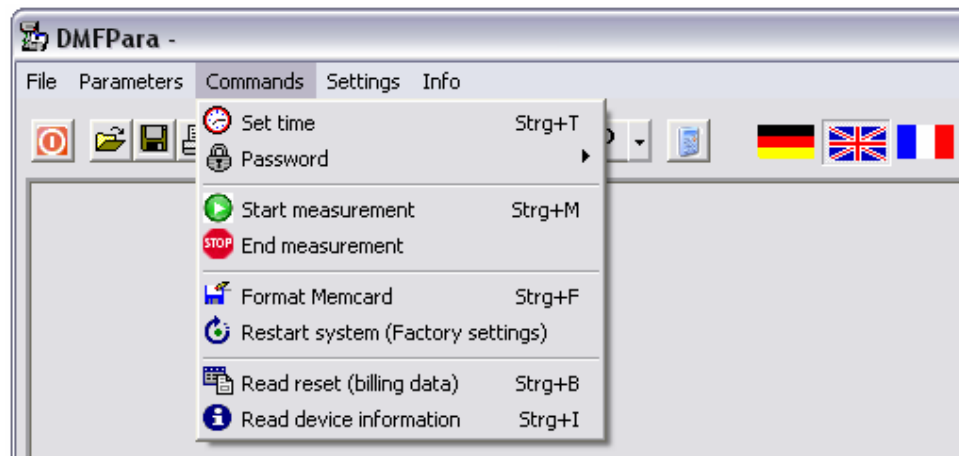


Figure 26, Menu Commands

For some commands you need enter a password.

6.1 Set time



Set the time, parameters for summertime switching and internal radio clock.

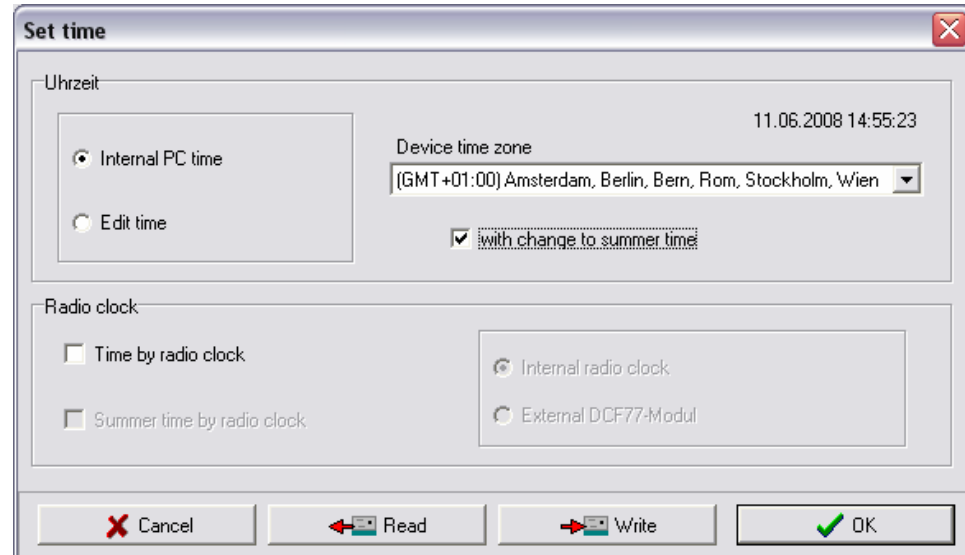


Figure 27, Set time

6.2 Password



Connect the service interface of the device to the PC/laptop by means of a programming cable. Enter the password.

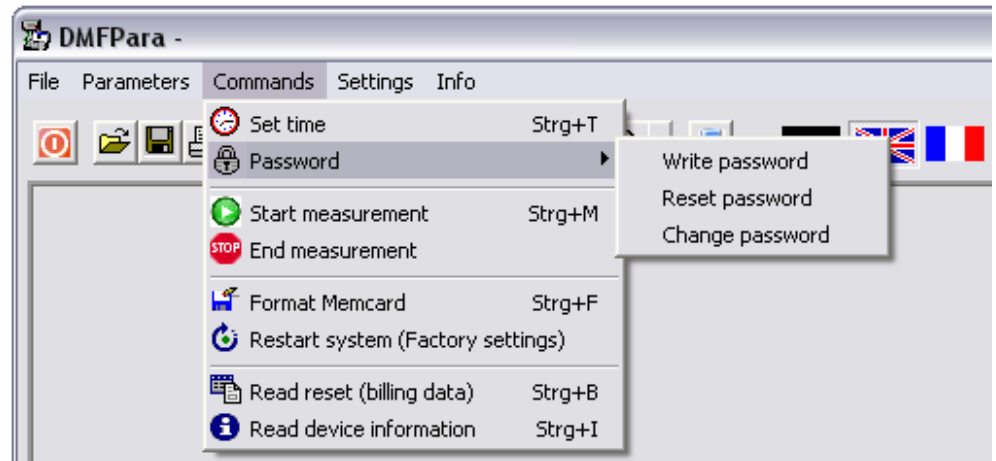


Figure 28, Password

6.2.1. Enter password

Enter the correct password for parameterization:

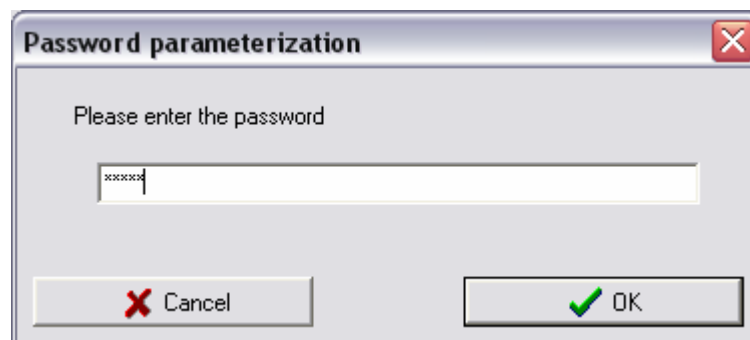


Figure 29, Password for parameterization

Checking password:

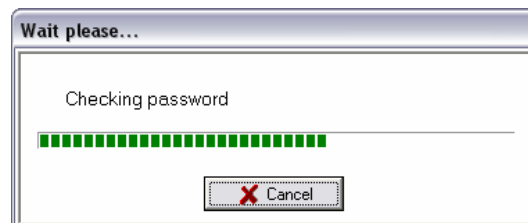


Figure 30, Password check

If you enter a wrong password you get a message:



Figure 31, Error message

In order to set the device's parameters values with the parameter setting program, it is necessary to activate it through the entry of the proper parameter password.

Note: Once the device accepts the password it will stay active for 15 minutes and will be automatically reset afterwards. If you want to program the device after this time has elapsed, you need to re-enter the password.

6.2.2. Password reset



With the selection of this menu item the password will be reset. This means that the parameter password will have to be re-entered for all functions which require this password entry (e.g. setting parameters).

Note: This option is in addition to the automatic reset after 15 minutes of inactivity

6.2.3. Change password

In order to change the passwords in the device, you first need to enter the correct active password for parameterization (factory setting for this password: **12345**).

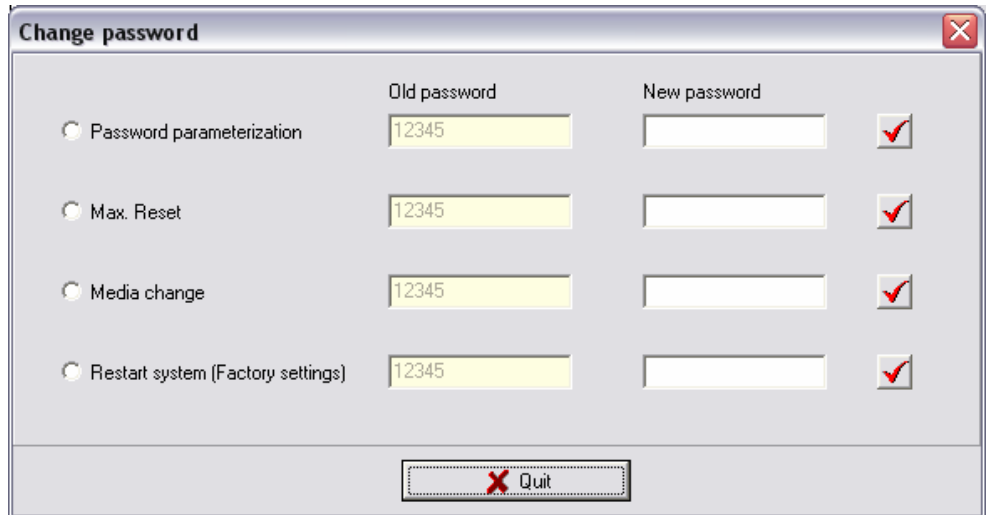


Figure 32, Change password

Select the category for which a new password shall be defined (Password parameterization, Max. Reset / Billing data, Media change or Restart system) and enter the new password. Then enter the new password in the field “New password”, click the button  and repeat the password after request.

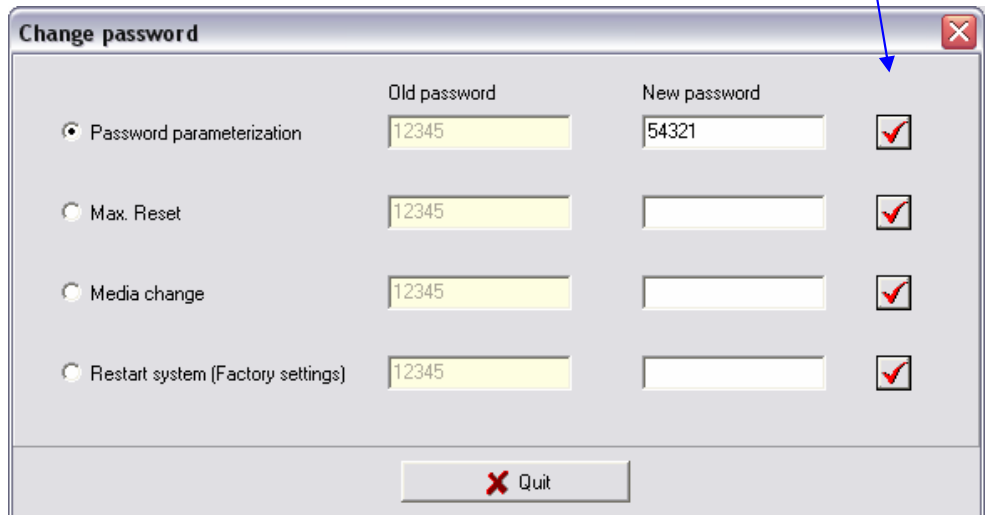


Figure 33, Change password for parameterization

Repeat the new password (for parameterization only):



Figure 34, Repeat the new password for parameterization

If both passwords are identical the device will be programmed to the new password. If you have entered two different passwords, an error message will be displayed. The new password will not be accepted and the original password remains active.

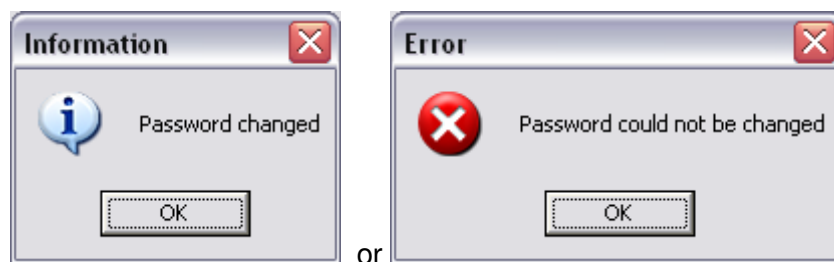


Figure 35, Messages

Note: You can change only one password at once.

Important: If you forgot the password you need to perform a unit restart (factory settings). Please note that during a unit restart all currently stored data will be lost. Therefore the device should be read prior to this!

6.3 Start measurement



Measurements can only be started if the parameter password has been entered.

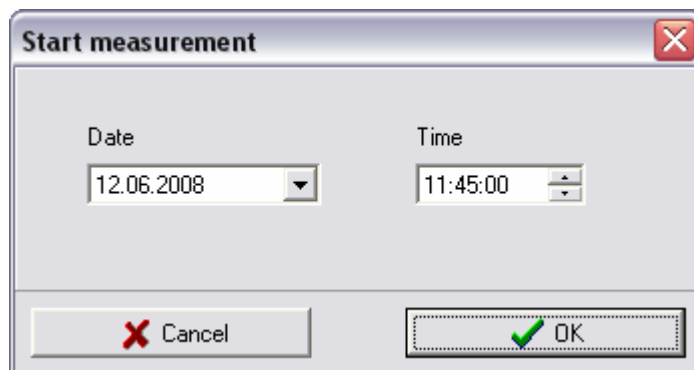


Figure 36, Start measurement

The upper starting time which appears is from the menu item "Parameters - General". It is possible that the starting time that appears here has already passed (error message "Start time is over"). In this case select the lower starting time or change the starting time in the menu item "Registration period". The lower position starting time is the next possible starting time for the registration device determined on the basis of the Integration period settings and the current time

6.4 End measurement



With the selection of this menu item and the subsequent entry of the password for parameterization the measurements being carried out by the corresponding device will be ended. The registration device will then label the measurement's end-point and its program will be ended.

Important: All of the telecounter's inputs will also be deactivated!

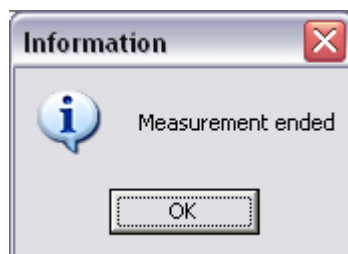


Figure 37, End measurement

The inputs on the device will have to be re-programmed before new measurements can be started (see the menu item "Meter registers: values").

6.5 Format Memcard

With this function, a memory card in the MSC01 compartment can be formatted to allow for its reprogramming.

To format a memory card make sure that the proper Memcard is installed in the MSC01 unit and that it is not over-write protected. Activate the registration device. Select this menu item and enter the password for "**Media change**".

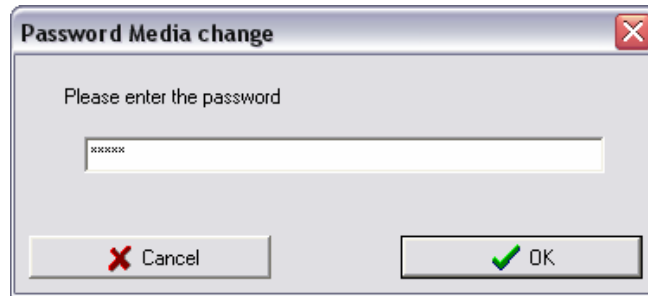


Figure 38, Format for media change



Figure 39, Format memory card

6.6 Restart system (Factory settings)

Important: A system restart means that all of the data in the device that is currently connected will be erased or reset! All of the previously set parameters and all of the current values will be reset back to the standard settings (factory settings)!

"Restart system" can only be activated when no measurements are being made on the registration device.

To initiate a registration device system restart do the following:

Select this menu item, enter the proper "Restart system" password when requested to do so and select the "OK" field or press the "Enter" key.



Figure 40, Password for restart system

To prevent the accidental loss of data the program will automatically stop this function and the message "Are you sure?" will appear:



Figure 41, Confirmation

To continue with the restart either select the "Yes" field.

If the error message "Wrong password" appears, then check to make sure that the password is correct



Figure 42, Error message

The system restart will be acknowledged through the "Restart system executed" message.

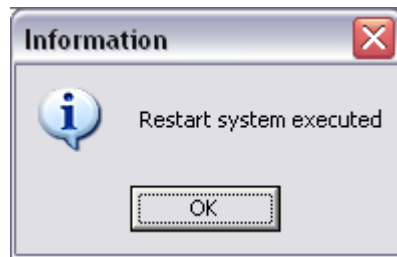


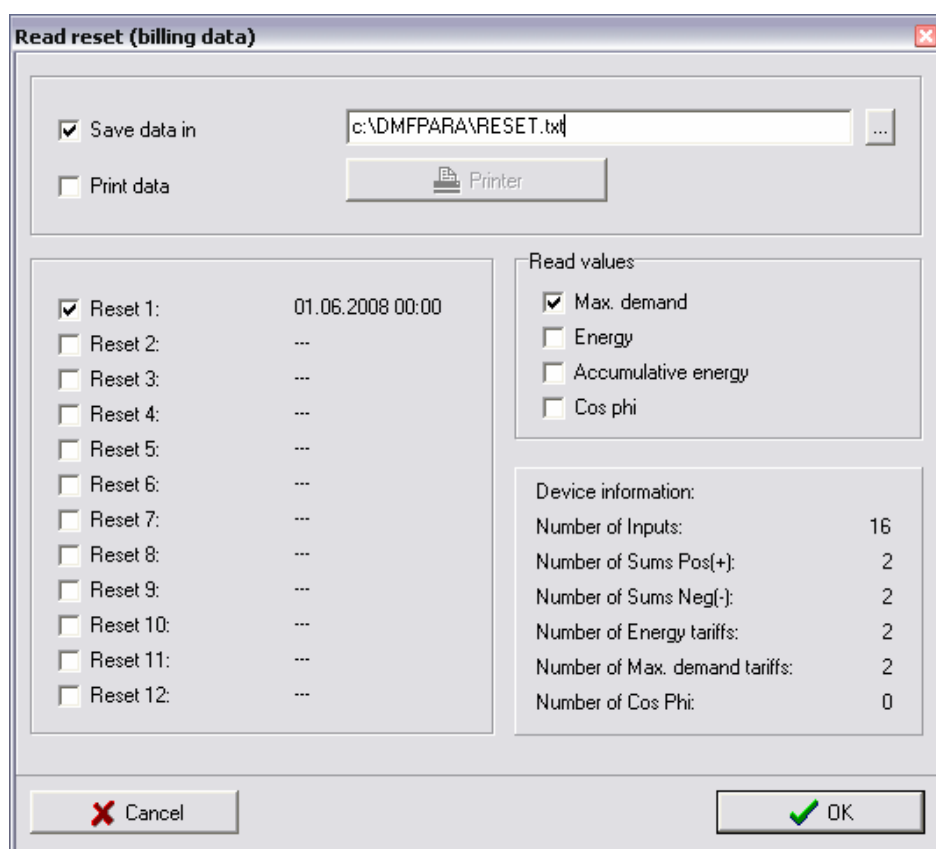
Figure 43, Restart system executed

With the telecounter's system restarted the device will under-go a system test after which it will be in the basic status (factory settings).

The registration device will have to be re-programmed before it will again be ready for service!

6.7 Read reset list (billing data)

Read out of the previous reset information (billing data) from the corresponding unit:



Reset	Date/Time
☒ Reset 1:	01.06.2008 00:00
☐ Reset 2:	---
☐ Reset 3:	---
☐ Reset 4:	---
☐ Reset 5:	---
☐ Reset 6:	---
☐ Reset 7:	---
☐ Reset 8:	---
☐ Reset 9:	---
☐ Reset 10:	---
☐ Reset 11:	---
☐ Reset 12:	---

Device information:	
Number of Inputs:	16
Number of Sums Pos(+):	2
Number of Sums Neg(-):	2
Number of Energy tariffs:	2
Number of Max. demand tariffs:	2
Number of Cos Phi:	0

Figure 44, Read reset (billing data)

Data from previous resettings of the connected registration device will be read out when requested here:

- **Save data in:** This field is for entry of the file name in which the read out data should be saved. After the read out will be placed in the directory of the parameter setting program. This is an ASCII type file (*.TXT) and can be read and processed with any editor (e.g. Word or WordPad).
- **Print data:** then the data can be printed out on a printer that is connected
- **Read values:** select the values for reading.
- **Reset x:** select the reset (billing data)
- **OK:** read data (save/print)

6.8 Read device information



Read device information and show a message:



Figure 45, Device information

For access click the title bar in main menu:

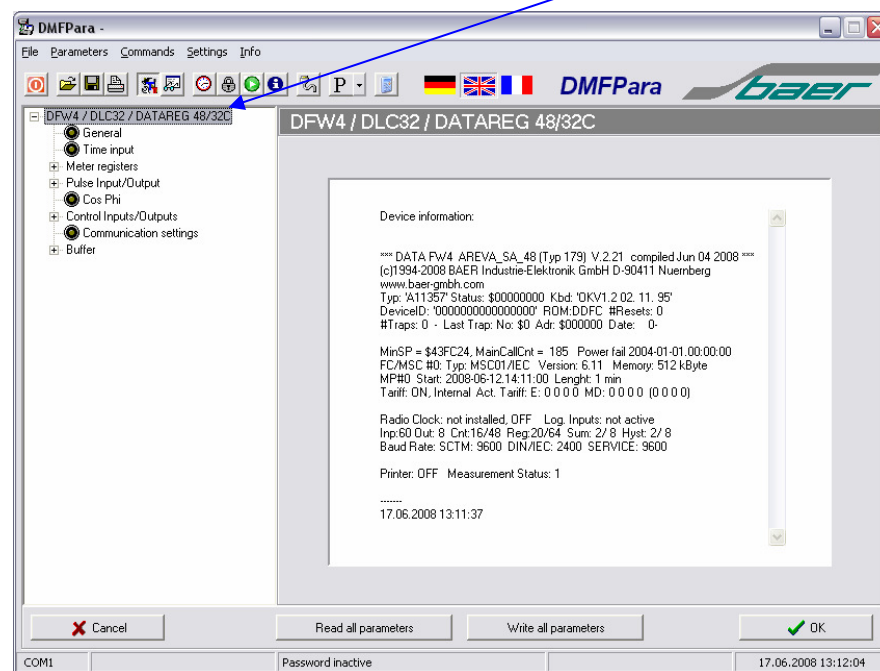


Figure 46, Main menu: device information

7 Menu Settings

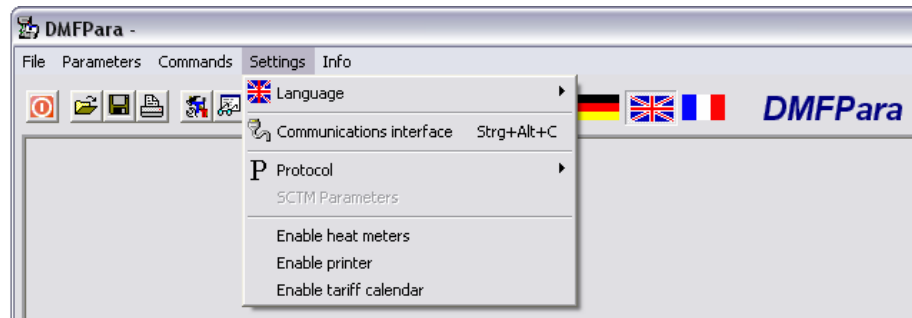


Figure 47, Menu Settings

7.1 Language

Select a language for the programming software **DMFPara**:



German



English



French

Note: After a change of language exit please the programming software **DMFPara** and start it again.

7.2 Communications interface (PC)



Defines the PC COM port used to connect to a device via programming cable. Select the desired COM port (Com1 to Com255) and click on the button "OK".

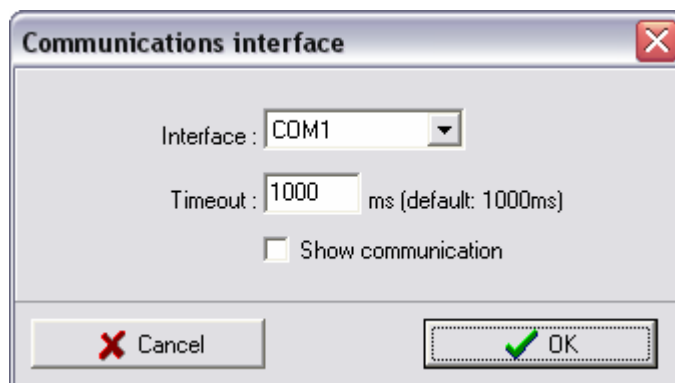


Figure 48, Communications interface

Timeout is depended on the PC interface.

Show communication: additional window with data flow; by active communication window the data transmission is slower!

7.3 Protocol



Select the protocol between PC and device.

Standard: "DFW4 / DLC32+19 / DATAREG 48+32C"

Optional: "7FMS1 / Data Logger / DATAREG 8"

7.4 Add-on menus

It is possible to activate some add-on menus (if needed). In this case the reading/writing of parameter will be slower.

Following add-on menus are possible:

- Parameter for heat meters (reading via M-Bus interface)
- Parameter for internal or external printer
- Tariff calendar

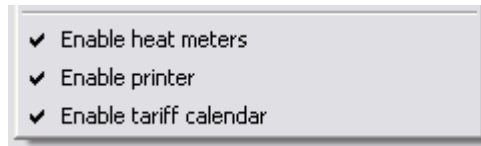


Figure 49, Add-on menus

For activation click the option.

8 Menu “Device parameterization”

You should perform a unit restart (to factory default settings) before programming a device. Changes to some of the parameters will trigger automatic erasure of the load profile memory. The relevant password must be entered correctly before changing any parameters in the registration device otherwise the unit will not change the parameters and will display a corresponding error message.

Note: For information about “7FMS1 / Data Logger / DATAREG 8” see chapter 9

Important: You should read the parameters and the stored data from the connected unit before you change the parameters!

The device can be programmed in the following ways:

1. “Online-programming”: individual parameters are sent directly from the relevant dialog windows to the data logger by using the action button “Write” after having been modified.
2. By using the menu item “Write all parameters”.

Please proceed as follows:

- Connect the service interface of the device with a free COM port of your PC using a programming cable.
- Put the program protection switch of the device (behind the display/keyboard unit) into the position down/enable (red LED is off; see the “DataFW4 / DATAREG User Manual”).
- Create or open a parameter file (extension “.PAR”).
- Enter the valid password (menu item “Write password”).
- Program the device (menu item or button “Write all parameters”).

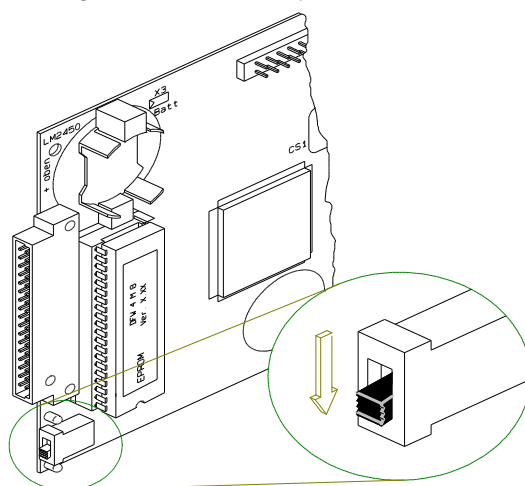


Figure 50, Protection switch

8.1 General

Show and set the general parameter:

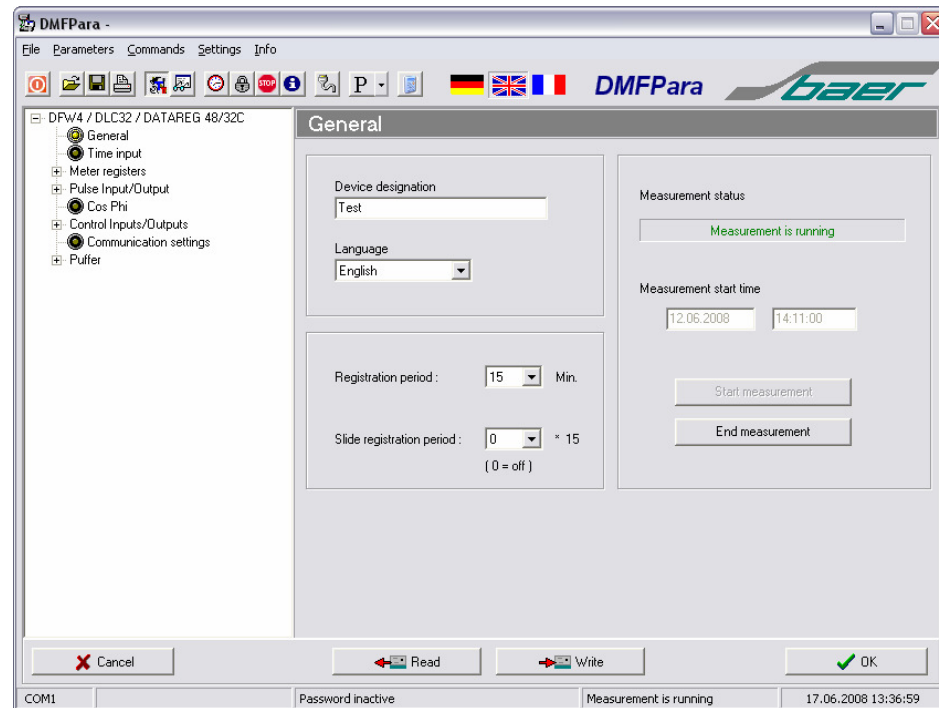


Figure 51, General

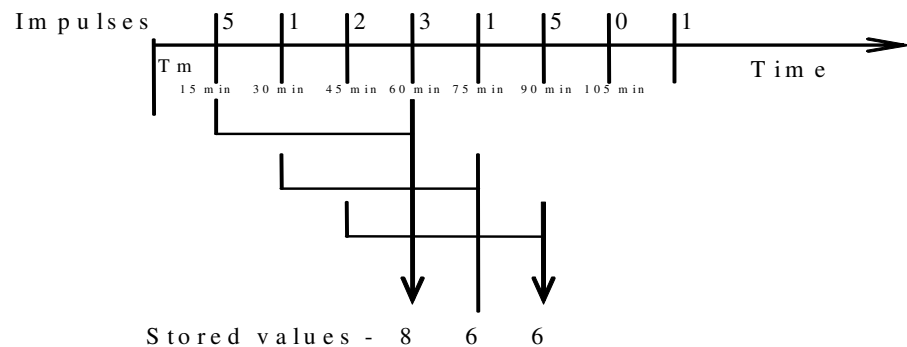
- **Device designation:** A label for the registration device can be assigned here that will be displayed over the use of the scroll button (address: 70010).
- **Language:** Select the language (for the device display). Currently four languages are available: English, German, French and Nederland.

This dialog does not change the language used in the programming software **DMFPara**: see the menu “Settings - Language” (page 37).

- **Registration period:** Definition of the length of registration period (1-60 Minutes).

- **Slide registration period:** For setting the length of time (a multiple of the fixed measuring period) of the flexible measuring period.

Example: Slide measuring period = $3 \times T_m$ ($3 \times 15 \text{ min.}$) = 45 min



- **Measurement status:** Shows the status information.
- **Measurement start time:** Shows the start time.
- **Start measurement:** If nothing is changed in this field, the measurement will start at the beginning of the next full hour after calling up the program (As indicated in this field); see the menu „Commands - Start measurement“, page 31.
- **End measurement:** Stops measurement; see the menu „Commands - End measurement“, page 31.

8.2 Time input

Set the time, parameters for the synchronization and summertime switching including the date and time of the switching.

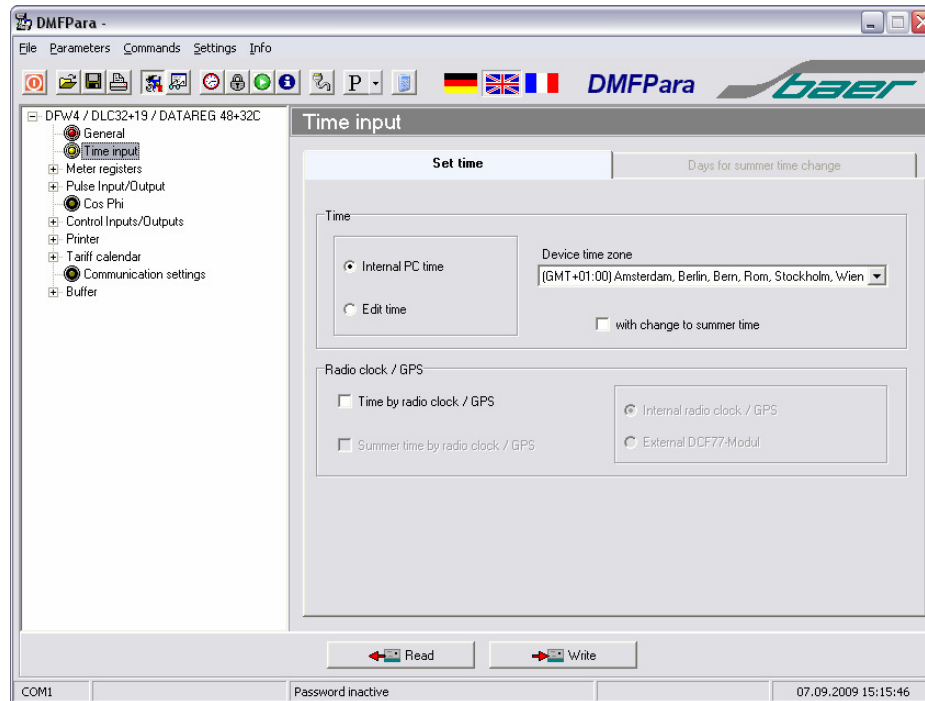


Figure 52, Set time

- **Internal PC time:** The device will be set to the current date and time of the PC where the programming software is installed
- **Edit time:** The device will be set to the values entered into the fields “Date” and “Time” at the time of setting all parameters

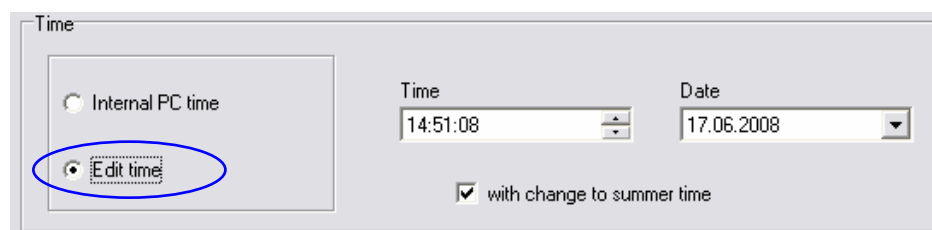


Figure 53, Edit time

Note: If a start time has been set, then be careful about changing the time or date because this might collide with the start time.
If the registration device is equipped with a radio-controlled clock, then the Edit time will be accepted only if the date entry is for the current date!

- *With change to summer time:* This activates the adjustments that are set in the "Summertime begin" and "Wintertime begin" fields. The wintertime is active when a comma (,) appears in the field between the day of the week and the time, and summertime is active when a period (.) appears. If there is no indication there, then the summertime / wintertime switching is turned-off.
- *Time by radio clock / GPS:* If the registration device is equipped with a radio-controlled clock (internal or external) or GPS, this will activate the reception.



Figure 54, Radio clock

- *Summer time by radio clock / GPS:* This activates / deactivates the summertime / wintertime switching over the radio clock or GPS.
Notice: If this and the "Toggle summer time" are both selected, then the "Summertime begin" and "Wintertime begin" fields will have no function as this would be done automatically over the radio clock.
- *Internal radio clock / GPS:* this activates the internal radio clock (possible in Germany only) or GPS.
- *External DCF77-Modul:* this activates the external radio clock (possible in Germany only). Enable the input SYN: menu "Control Inputs/Outputs - General ports", see page 64

Settings for the start of summertime for the next 5 years:

These can be set for any date and time, as is required. The unit time clock will be pushed forward one hour (e.g. from 02:00 o'clock to 03:00 o'clock.) when the set summertime is reached.

Standard: Summer time (daylight saving time) for Germany (European Union)

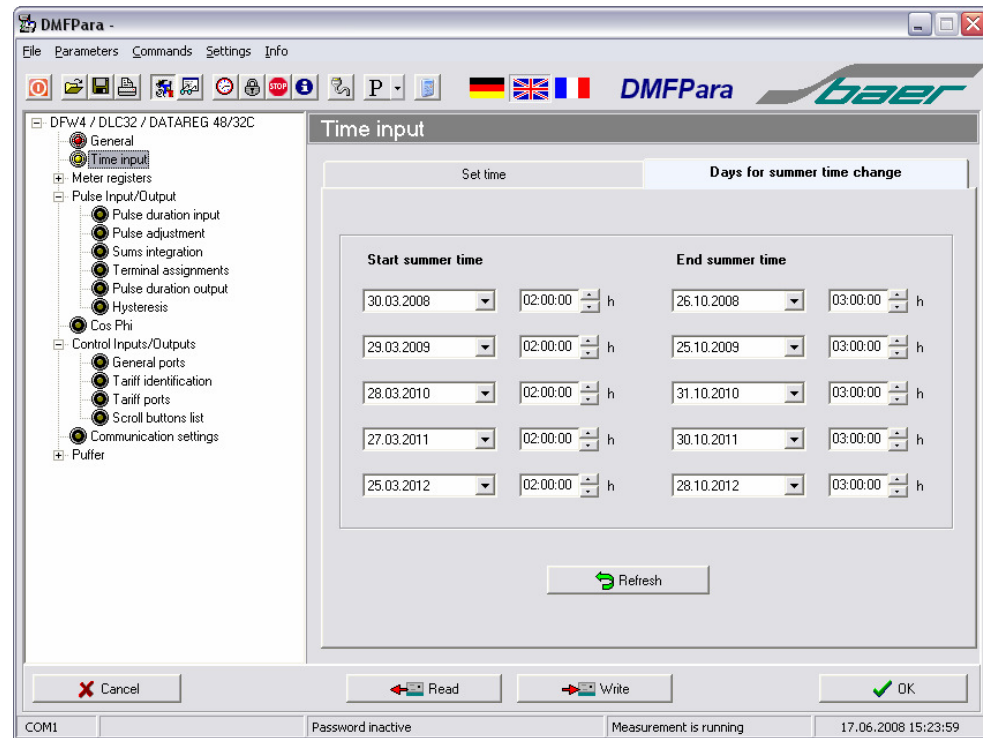


Figure 55, Days for summer time change



The summertime changes for the next 5 years will be recalculated with selection of this item. The PC time (not the edit time), with the current year as the determining factor, will be used as the basis for these recalculations.

8.3 Meter Registers

8.3.1. Inputs/Sums/Tariffs

Definition of the number of inputs, number of sums and number of tariff rates

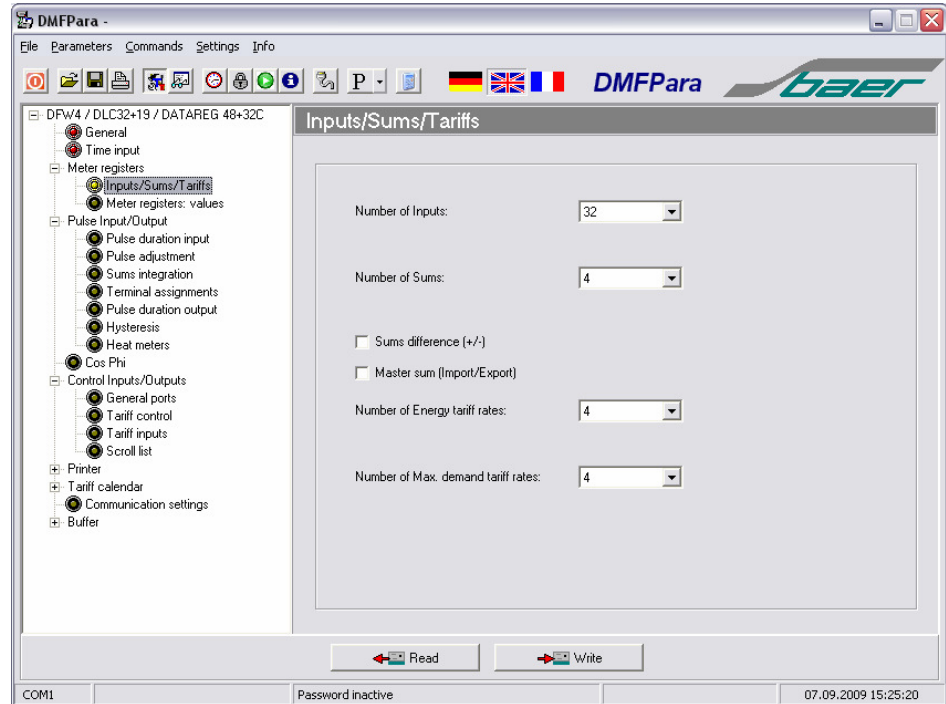


Figure 56, Inputs/Sums/Tariffs

- **Number of Inputs:** For entering the total number of active inputs
- **Number of Sums:** For entering the number of active sums registers

Note: This number must be between 1 and the number of ordered inputs or sums.

- **Sums difference (+/-):** To be selected if sum differences should be formed; see also the menu "Pulse Input/Output - Hysteresis", page 60
- **Master sum (Import/Export):** To be selected if master sum should be formed (power plant calculation for generation or non-generation mode):

Sum 2 (Reactive Energy) = Function [Sum 1 (Active Energy)]
 if "Sum (1) Active Export > 0" then "Sum (2) Reactive Export"
 if "Sum (1) Active Export = 0" then "Sum (2) Reactive Export"
 if "Sum (1) Active Export < 0" then "Sum (2) Reactive Import"
 with:
 Sum Active Export := Sum 1+
 Sum Active Import := Sum 1-
 Sum Reactive Export := Sum 2+
 Sum Reactive Import := Sum 2-

Results: see the register address 190-xx of DataFW4 / DATAREG

- **Number of Energy tariff rates:** For entering the number of active energy tariff rates
- **Number of Max. demand tariff rates:** For entering the number of active maximum demand tariff rates

8.3.2. Meter registers values

For setting the initial value in the selected tariff for the input or sum (8 digits)

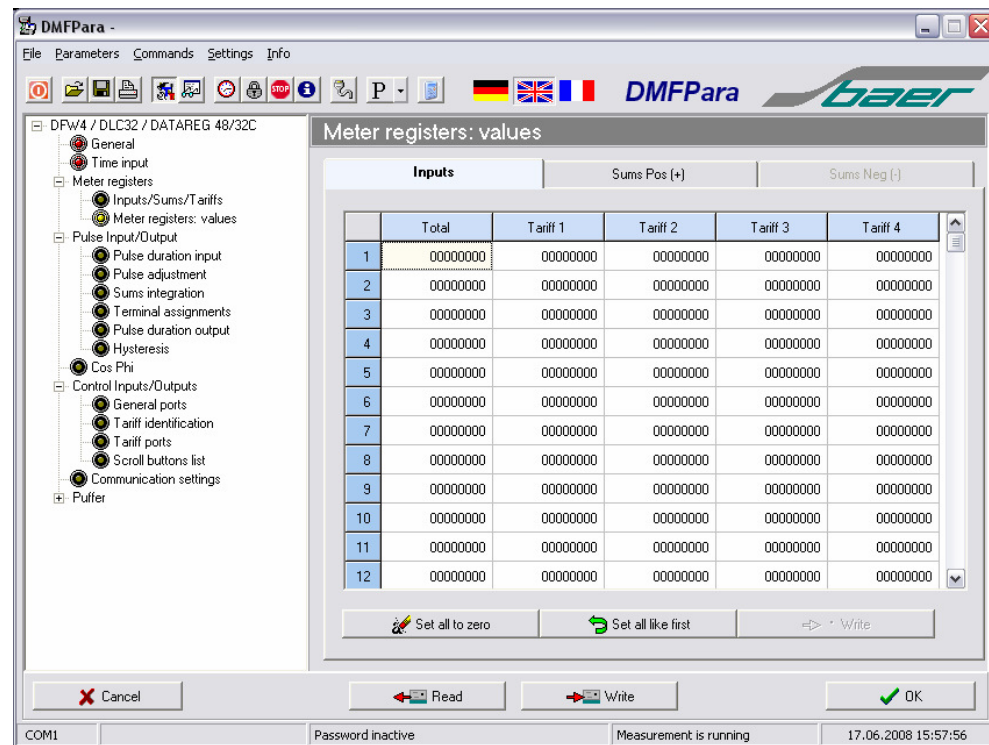
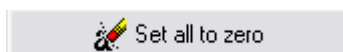


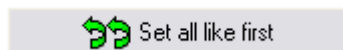
Figure 57, Inputs

A meter register reading of 00000000 is also allowed.

Note: If the menu item "Read" was selected and the "Counter value" was activated, then the value at the time of the last meter reading will appear here after the selection of the counter and the tariff



Sett all inputs or sums to „00000000“



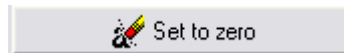
Set all inputs or sums to value like first input or sum.

Select the counter for which you want to adjust the energy value by a click on the left site of the line:

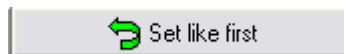


2	00000000	00000000	00000000	00000000	00000000
3	00000000	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000	00000000

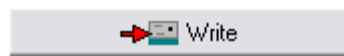
Figure 58, Select an input



Set the input to „00000000“.



Set the input to value like the first value.



Write the values for one input or sum.

8.4 Pulse Input/Output

All pulses at the inputs will be counted after debouncing and then processed according the menus below.

Pulse processing in the device;
example for DataFW4, DLC32, DLC19, DATAREG 48 and DATAREG 32C:

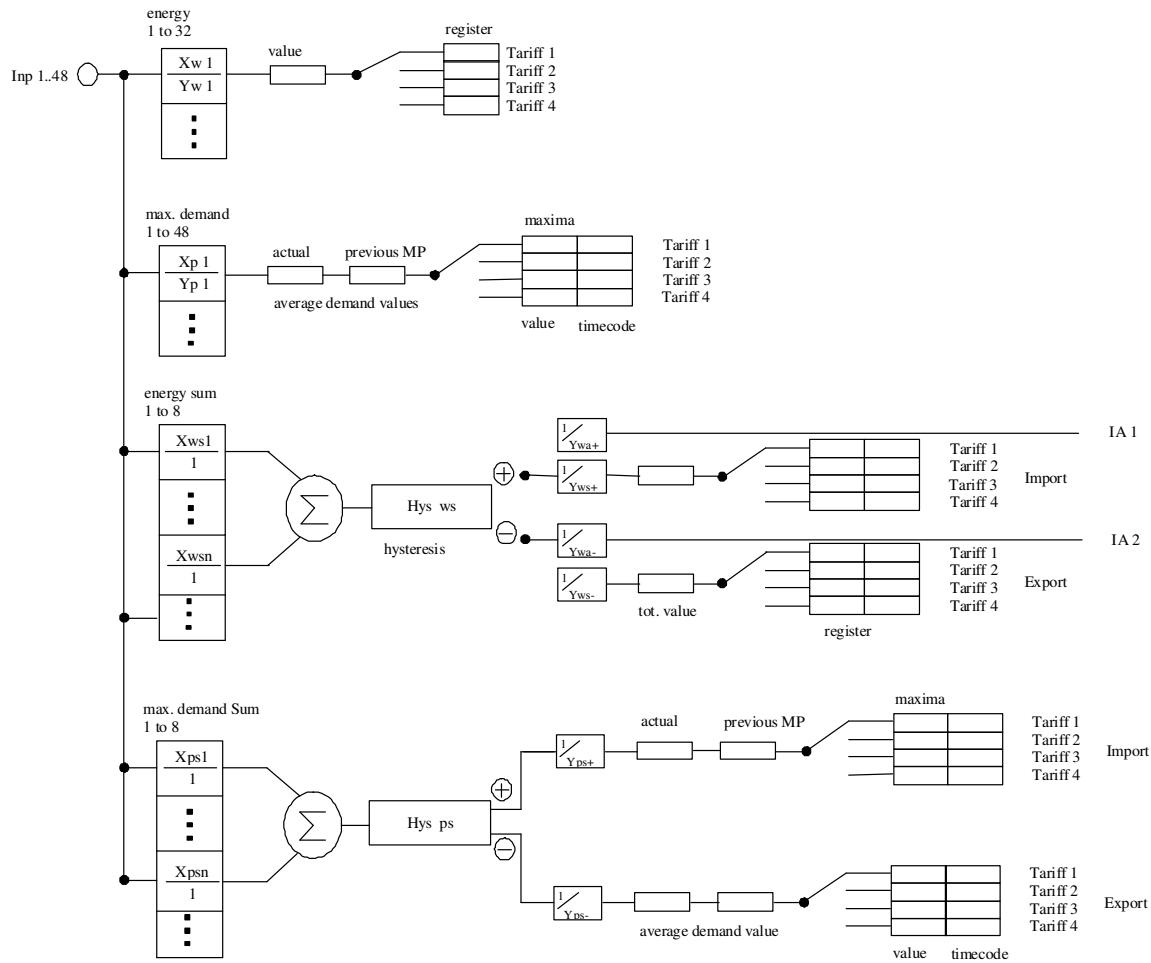


Figure 59, Pulse processing

8.4.1. Pulse duration

Definition of input conditioning parameters (debouncing) for each input

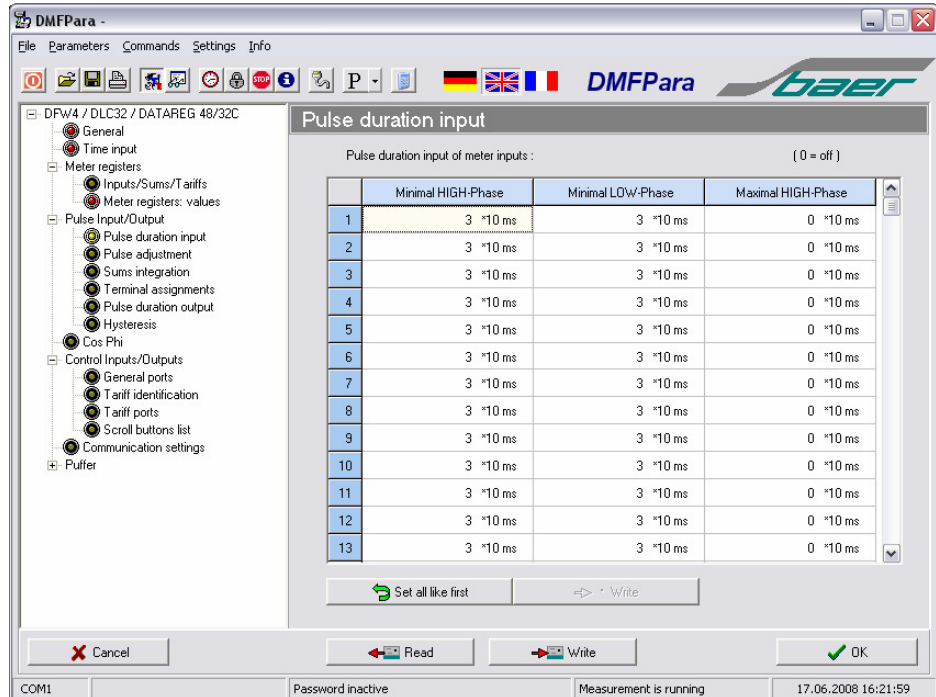


Figure 60, Pulse duration

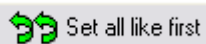
- **Minimal HIGH-Phase:** Defines the minimum length of incoming pulses. Pulses shorter than this duration are not accepted by the device and will not be registered. The default setting is 30ms (3×10ms).
- **Minimal LOW-Phase:** Defines the minimum length of the interval between two incoming pulses. Intervals shorter than this time will not be accepted by the device and as a consequence the pulses will not be counted separately. The default setting is 30ms (3×10ms)

Note: If the device is equipped with bi-current input modules (IED) then for these inputs you must set the minimal HIGH-Phase and the minimal LOW-Phase value to “1” to prevent loss of incoming pulses!

- **Maximal HIGH-Phase:** If an incoming pulse has duration longer than this value, the device will not register it (pulse length monitoring). This function is deactivated by entering the value “0”.

Note: The pulse input / output from the registration device is in steps of 10ms, so it is important to allow a tolerance of 10ms when setting these parameters!

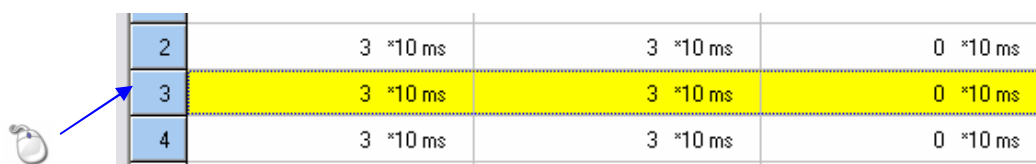
Example: For 80ms enter a "7";
For 120ms enter an "11".



Set all like first

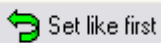
Set the values for all inputs like the first input.

Select the input for which you want to adjust the pulse length by a click on the left site of the line:



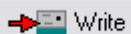
2	3 *10 ms	3 *10 ms	0 *10 ms
3	3 *10 ms	3 *10 ms	0 *10 ms
4	3 *10 ms	3 *10 ms	0 *10 ms

Figure 61, Select an input



Set like first

Set the values like the first input.



Write

Write the values for one input.

8.4.2. Pulse adjustment

Definition of the numerator and denominator of individual inputs depending on meter constants, transformer ratios and reading constants

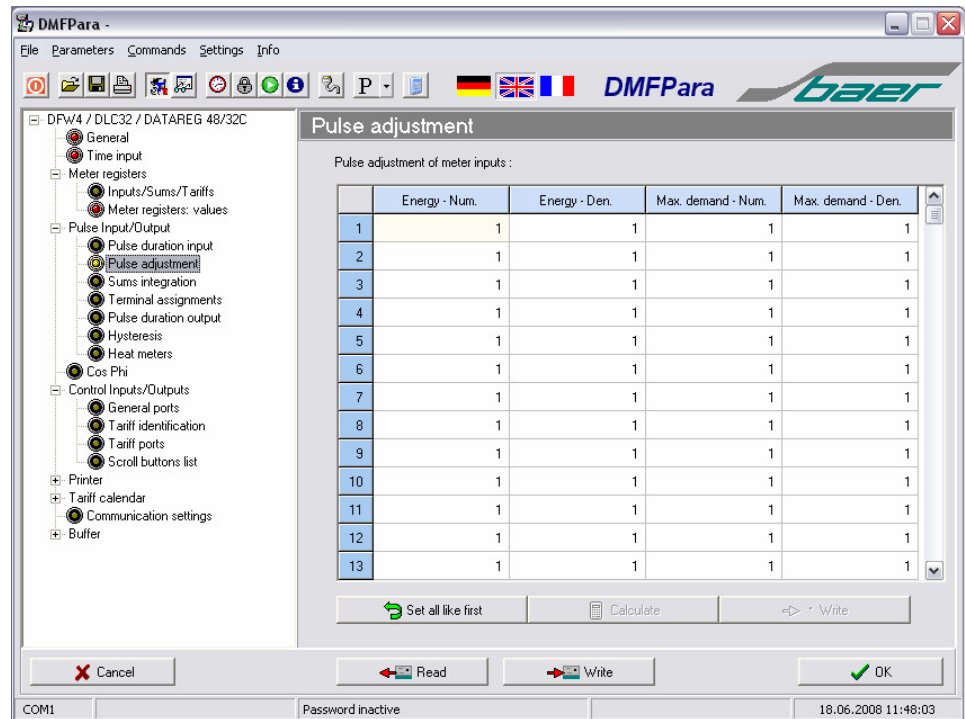


Figure 62, Pulse adjustment

Priorities for the individual inputs will be determined dependent on meter constants, transformer ratios and reading constants (refer to the information for the individual registration device).

Energy value weighing:

$$\frac{X_w}{Y_w} = \frac{W}{R \times K} \quad \text{Meter with transformer}$$

$$\frac{X_w}{Y_w} = \frac{I_{np}}{K} \quad \text{Meter without transformer}$$

Volume: $\frac{X_w}{Y_w} = \frac{V_{Inp}}{K}$ e.g. Heat meter

Maximum demand value weighing:

$$\frac{X_p}{Y_p} = \frac{60 \times W}{R \times K \times T_m} \quad \text{Meter with transformer}$$

$$\frac{X_p}{Y_p} = \frac{60 \times I_{np}}{K \times T_m} \quad \text{Meter without transformer}$$

Flow: $\frac{X_p}{Y_p} = \frac{60 \times V_{Inp}}{K \times T_m}$ e.g. Heat meter

X_w, Y_w Energy (Work/Volume): Numerator (X) and denominator (Y), whole numbers, 8 digits

X_p, Y_p Maximum demand (Power/Flow): Numerator (X) and denominator (Y), whole numbers, 8 digits

- W Transformer ratio (primary to secondary): $\frac{U_{pri}}{U_{sec}} \times \frac{I_{pri}}{I_{sec}}$
- R Meter constant (e.g. pulses/kWh, pulses/m³), can be found on the front plate of the transmitting meter.
- K Reading constant
- Inp Impulse constant (e.g. kWh/pulse), can be found on the front plate of the transmitting meter.
- VInp Impulse constant for volume (e.g. m³/pulse), can be found on the front plate of the transmitting meter.
- Tm Registration period (minutes)

Enter the correct values into the above formulas and reduce the result to the smallest value represented by whole numbers. Then enter the result into the input fields for the relevant input.

Note: The numerator and denominator values can only be entered in whole numbers (without decimals, maximum of 8 digits).

Important: Because the maximum demand values are displayed and stored with **4 digits** (0000 to 9999), it is necessary to define a suitable **reading constant** (K). It is determined by the following table:

Maximum demand (kW, m ³ /h)		Reading constant (K)
1	to 10	0,001 (=1/1000)
10	to 100	0,01 (=1/100)
100	to 1000	0,1 (=1/10)
1000	to 10000	1
10000	to 100000	10
100000	to 1000000	100

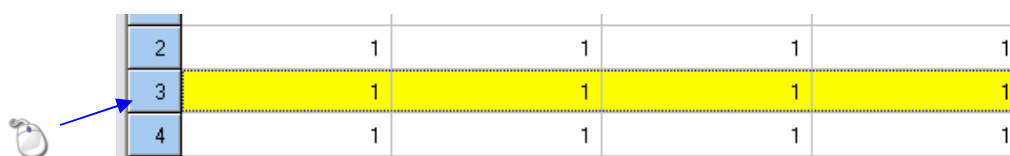
After multiplication of the displayed and stored demand value by the read constant, you obtain the actual demand. The reading constant for the energy values must be preferably set to maximum demand. However user-specific values are also permitted.



Set all like first

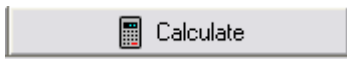
Set the values for all inputs like the first input

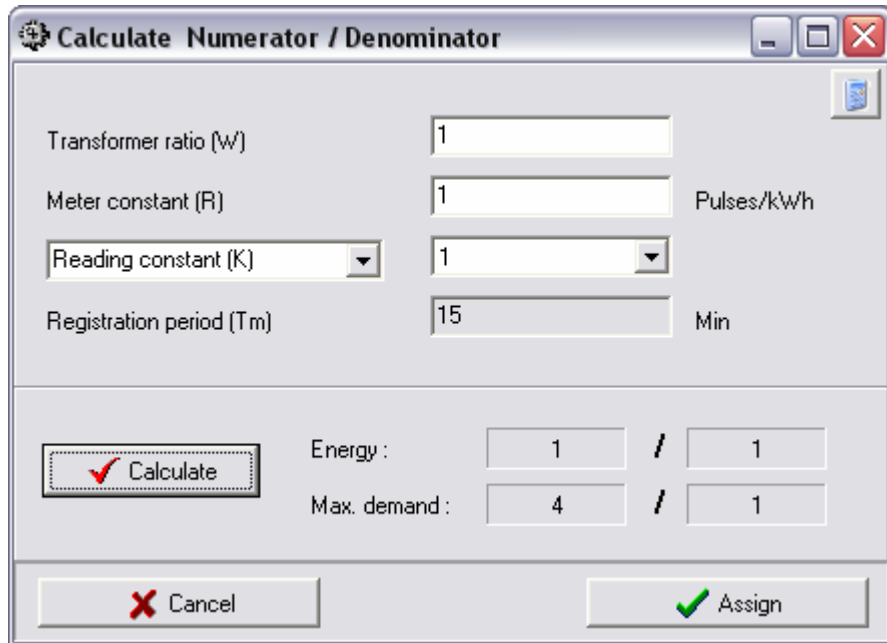
Select the input for which you want to adjust the pulse adjustment by a click on the left site of the line:



2	1	1	1	1
3	1	1	1	1
4	1	1	1	1

Figure 63, Select an input

-  Set the values like the first input
-  Write the values for one input
-  Possible only if a line is marked. Activate a wizard for calculation of numerator and denominator

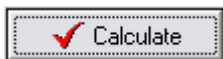


The dialog box titled "Calculate Numerator / Denominator" contains the following fields and controls:

- Transformer ratio (W): 1
- Meter constant (R): 1 Pulses/kWh
- Reading constant (K): 1 (dropdown menu)
- Registration period (Tm): 15 Min
- Buttons: Calculate (with checkmark), Cancel (with X), Assign (with checkmark)
- Energy: 1 / 1
- Max. demand: 4 / 1

Figure 64, Calculate

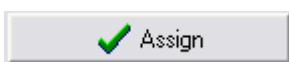
Calculate Numerator / Denominator

 Calculate the numerator and denominator

Energy : 1 / 1

Max. demand : 4 / 1

Figure 65, Result

-  Assign the numerator and denominator



Open MS-Windows calculator.

8.4.3. Sum integration

Allocation of inputs to the desired summation unit

For assignment of input values for energy and demand factors which are to be available to the various sum registers.

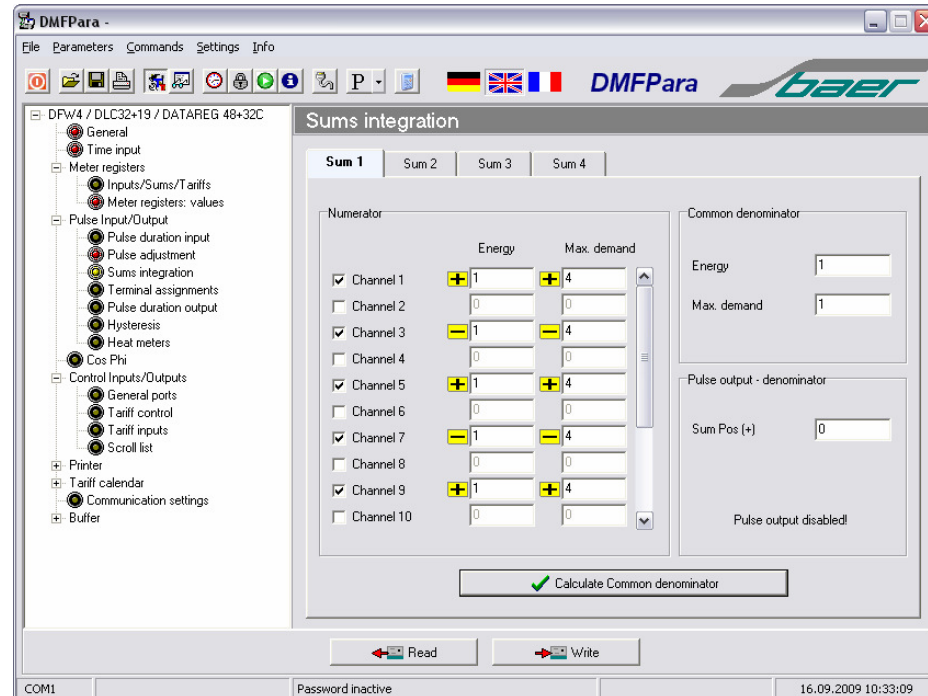


Figure 66, Sums

Calculations for all of the pulse inputs that are to be included in the sums are done here.

$$\text{Energy: } \frac{X_{ws}}{Y_{ws}} = \frac{W}{R \times K_{ws}} \quad \text{Max. demand: } \frac{X_{ps}}{Y_{ps}} = \frac{60 \times W}{R \times T_m \times K_{ps}}$$

X_{ws} Energy: Numerator (X) and Y_{ws} common denominator (Y), whole numbers, 8 digits

X_{ps} Maximum demand (Power): Numerator (X) and Y_{ps} common denominator (Y), whole numbers, 8 digits

W Transformer ratio (primary to secondary): $\frac{U_{pri}}{U_{sec}} \times \frac{I_{pri}}{I_{sec}}$

R Meter constant (e.g. pulses/kWh), can be found on the front plate of the transmitting meter.

K Reading constant

T_m Registration period (minutes)

S Sum (between 1 and 8)

Note: Each summation unit in the device uses two registers: a positive sum and a negative sum (e.g. for import and export)

- **Numerator:** For setting the energy value numerator of the selected input
- **Common denominator:** For setting the energy value denominator of the selected input
- **Pulse output - denominator:** For settings the pulse output. Defines the value for the weighting of output pulses. If there are sum that should not be display to the output, then a "0" must be entered for those sum

Note: These values are active only if the sums are assigned to an output; see the menu "Terminal assignments"

To calculate the pulse ratio of the pulse outputs use the formula, 8 digits:

$$X_{\text{output}} = \frac{Y_{\text{ws}}}{R_{\text{out}} \times K_{\text{ws}}}$$

Yws: Common denominator for energy

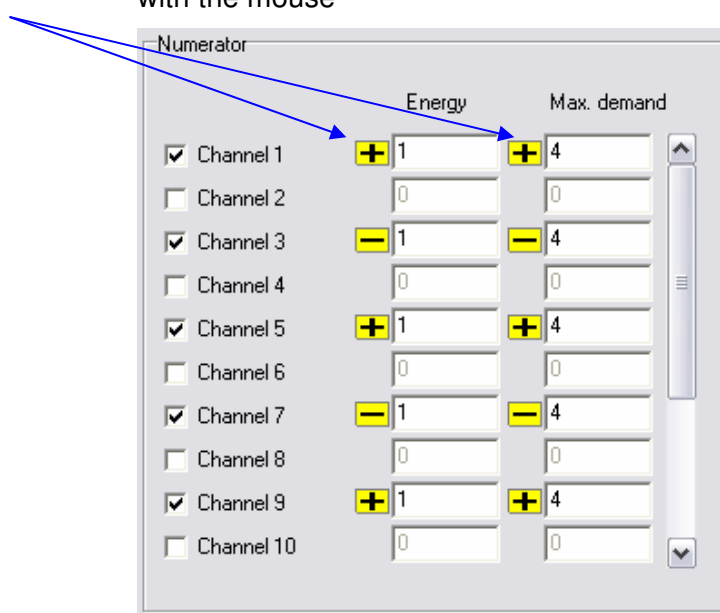
Rout: Meter constant for the sum (e.g. pulses/kWh),

Kws: Reading constant

Selection of the input that is to be assigned.



You can toggle between "+", "-", and " " (inactive) by clicking on the buttons with the mouse



Channel	Selected	Energy Sign	Energy Value	Max. demand Sign	Max. demand Value
Channel 1	☒	+	1	+	4
Channel 2	☐		0		0
Channel 3	☒	-	1	-	4
Channel 4	☐		0		0
Channel 5	☒	+	1	+	4
Channel 6	☐		0		0
Channel 7	☒	-	1	-	4
Channel 8	☐		0		0
Channel 9	☒	+	1	+	4
Channel 10	☐		0		0

Figure 67, Sum: numerator

-  Plus The input will be totaled into the positive sum.
-  Minus The input will be totaled into the negative sum.
-  Empty The input will not be totaled.

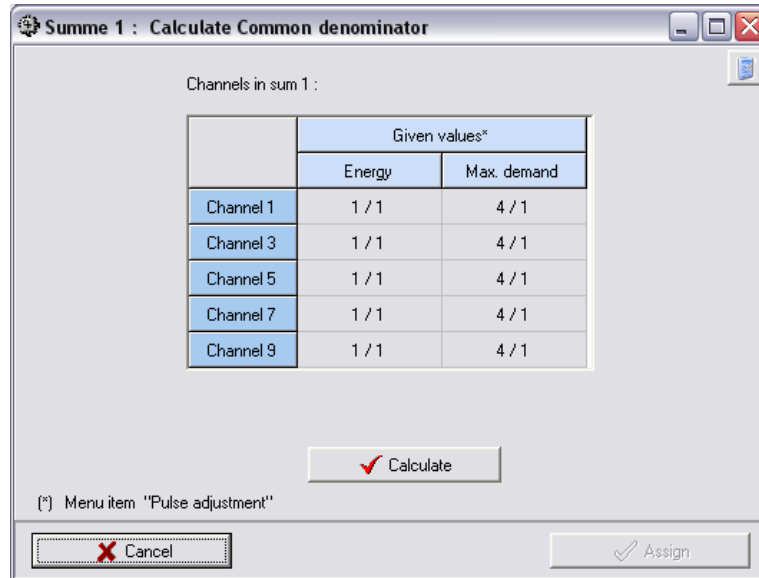
For assignment of input values and energy and demand factors which are to be available to the various sum registers you can use this wizard.

Note: If there are inputs that should not be added in the sums register, then a "0" must be entered for those inputs

 Calculate Common denominator

For calculation of the common denominator;

Given values: see the menu „Pulse adjustment“, page 50.



Channels in sum 1 :

	Given values*	
	Energy	Max. demand
Channel 1	1 / 1	4 / 1
Channel 3	1 / 1	4 / 1
Channel 5	1 / 1	4 / 1
Channel 7	1 / 1	4 / 1
Channel 9	1 / 1	4 / 1

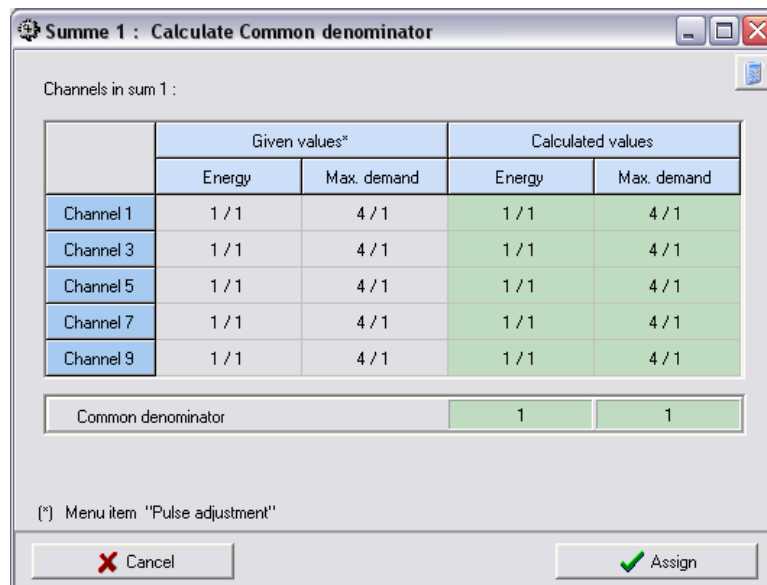
[*] Menu item "Pulse adjustment"

Buttons:  Cancel,  Assign

Figure 68, Sum: calculate

 Calculate

Calculation of common denominator



Channels in sum 1 :

	Given values*		Calculated values	
	Energy	Max. demand	Energy	Max. demand
Channel 1	1 / 1	4 / 1	1 / 1	4 / 1
Channel 3	1 / 1	4 / 1	1 / 1	4 / 1
Channel 5	1 / 1	4 / 1	1 / 1	4 / 1
Channel 7	1 / 1	4 / 1	1 / 1	4 / 1
Channel 9	1 / 1	4 / 1	1 / 1	4 / 1

Common denominator: 1, 1

[*] Menu item "Pulse adjustment"

Buttons:  Cancel,  Assign

Figure 69, Sum: calculate and assign

 Assign

Assign the numerator and denominator

8.4.4. Terminal assignments

Setting the parameters for control inputs

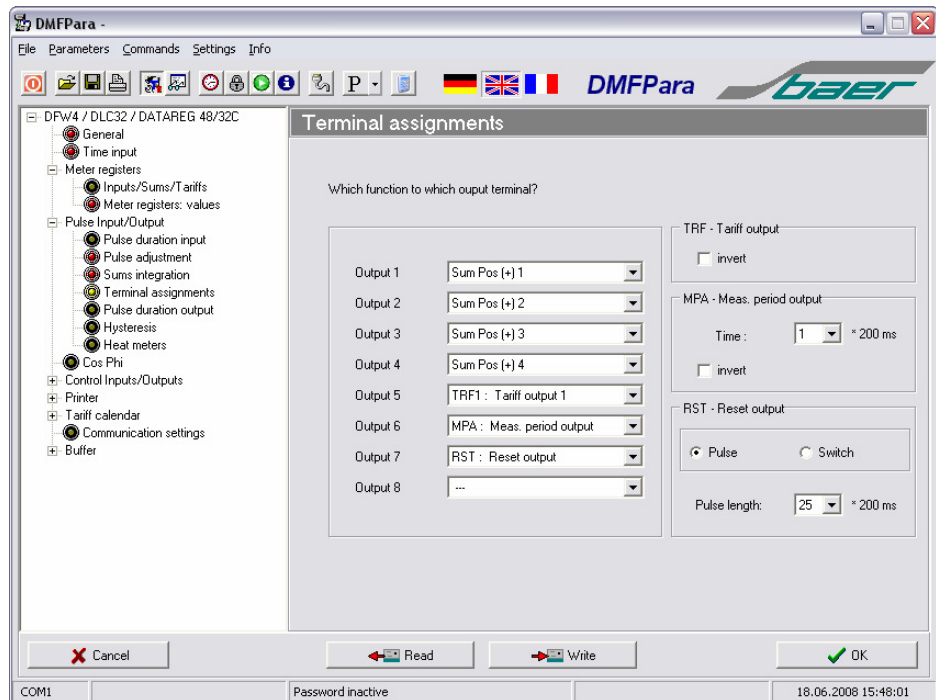


Figure 70, Terminal assignments

Each of the data logger's available sums pulse output terminals will be assigned a function every time it is started.

The following assignments are available for each output terminal:

- Positive sums pulse output 1 to 8.
- Negative sums pulse output 1 to 8; available only when the "Sums difference" is activated
- Registration period output (MPA)
- Tariff output 1 and 2 (TRF1 and TRF2)
- Reset output (RST)
- none (...)

It is also possible to assign the same function to several outputs, for example output 3 and output 4 as MPA

- **TRF – invert:** Inverts the tariff signal TRF
- **MPA – time:** For setting the length of time (in 200ms intervals) that the measuring period output should remain active after the end of a measuring period. The maximum setting, here, is "45" (45 × 200ms), or 9 seconds
- **MPA – invert:** Inverts the measuring period output signal MPA.
- **RST – pulse or switch:** Defines the mode for output RST.

- *RST – pulse length*: This field will appear only when the Reset switch is not selected. A reset pulse length of between 0 and 19.8 seconds (0 to 99 × 200ms) can be set here

Tariff output:

The two tariff outputs (TRF1 and TRF2) can be programmed so that a defined output status exists for each combination of energy and demand tariff rates.

Energy tariff	1	2	3	4
TRF1	0	1	0	1
TRF2	0	0	1	1

Example:

Output 1: SUM 1+	Output 3: MPA	Output 5: TRF1	Output 7: RST
Output 2: SUM 2+	Output 4: MPA	Output 6: TRF2	Output 8: RST

8.4.5. Pulse duration output

Setting the output pulse duration.

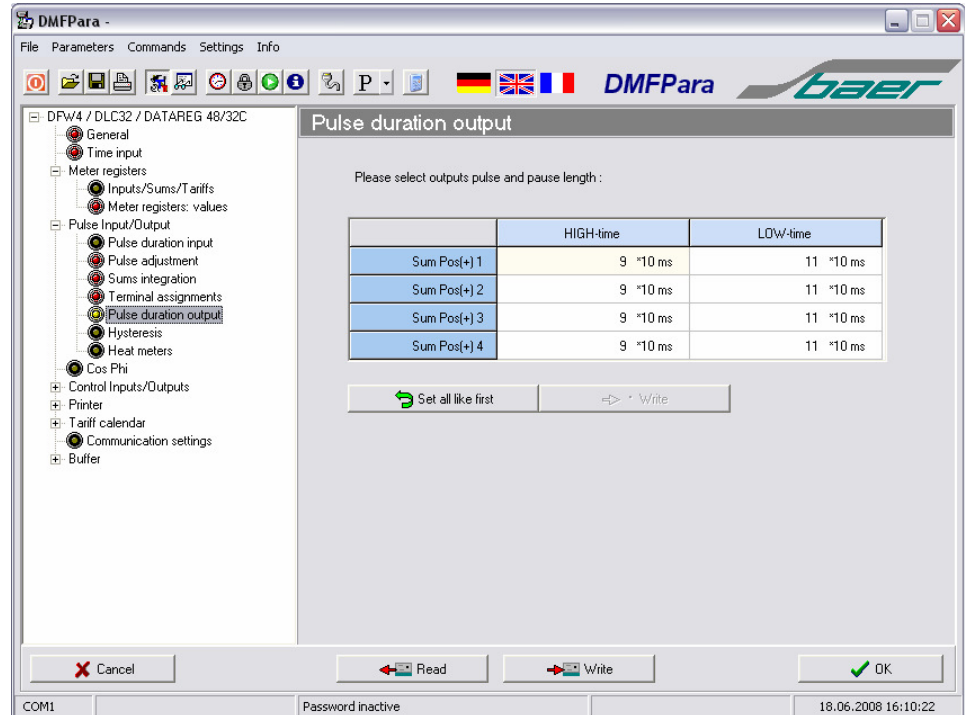


Figure 71, Pulse duration output

- **HIGH-time:** Designates the length of the output pulses. The settings are in units of 10ms. Values between 1 (10ms) and 200 (2000ms) can be entered. In the example the value 9 ($9 \times 10\text{ms} = 90\text{ms}$) is used.
- **LOW-time:** Designates the minimum length of the interval between pulses. The settings are in 10ms units, and can be set for between 10ms ("1") and 2000ms ("200"). In the example the value $11 \times 10\text{ms} = 110\text{ms}$ is used.

Set all like first

Set the values for all sums like the first sum

Write

Write the values for one sum

8.4.6. Hysteresis

For setting the hysteresis parameters.

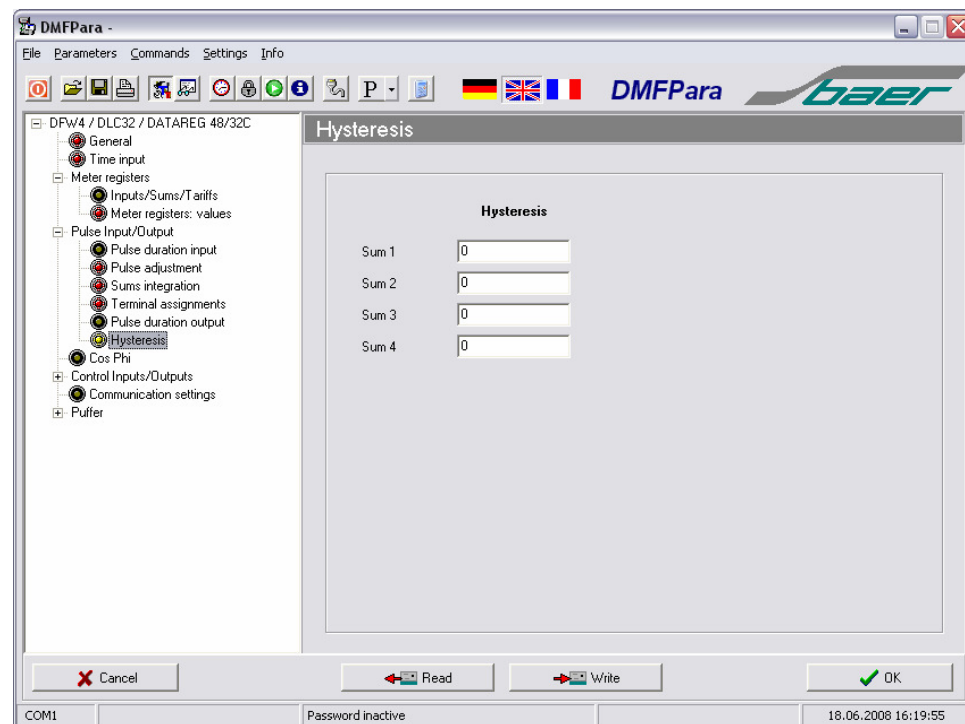


Figure 72, Hysteresis

Defines the capacity of the slack register (Hysteresis for pulses):

For the calculation of balanced sums the device can use a programmable slack or hysteresis. This is a temporary storage for incoming pulses. With each pulse of positive sign the content of the hysteresis register is increased by the value of that pulse, with each pulse of negative sign it is decreased accordingly.

Pulses only appear at the output of the summation unit once the programmable capacity of the hysteresis has been exceeded either in positive or negative direction. An integrated energy direction switch directs the pulses in the first case to the positive output and in the second case to the negative output.

We recommend using a hysteresis equal to the sum of numerators (from the pulse weighting dialog) of all active inputs.

If you set the hysteresis to "0", the calculation of balanced sums is deactivated for that summation unit.

Formula for calculation of hysteresis:

$$\text{Hys} = 2 \times (\sum X_{ws})$$

Xws: Energy: numerator; see the menu "Sum integration", page 54

8.4.7. Heat meters

Define the parameters for the heat meters:

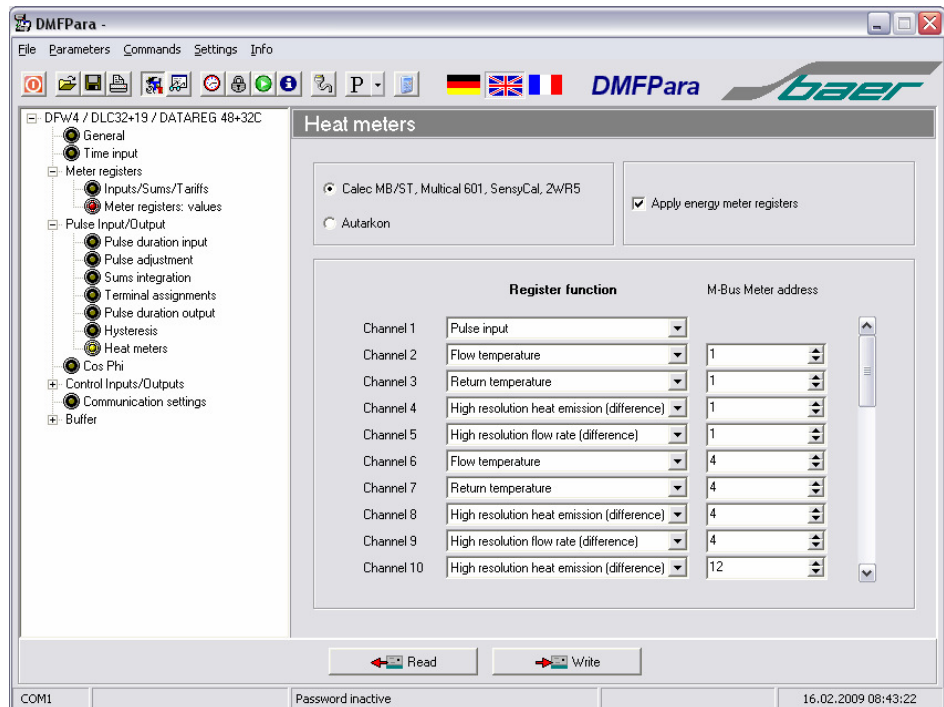


Figure 73, Heat meters

Possible register functions:

- **Pulse input:** Heat meter function disables;
- **Flow temperature:** Heat meter function enables;
average value; reading interval: 10sec.
- **Return temperature:** Heat meter function enables;
average value; reading interval: 10sec.
- **Temperature difference:** Heat meter function enables;
average value; reading interval: 10sec.
- **Instantaneous flow rate (average):** Heat meter function enables;
average value; reading interval: 10sec.
- **Instantaneous heat emission (average):** Heat meter function enables;
average value; reading interval: 10sec.
- **High resolution flow rate (difference):** Heat meter function enables;
difference;
- **High resolution heat emission (difference):** Heat meter function enables;
difference;

General parameter for heat meters:

- [Apply energy meter register](#): Heat meter function enables;
reading of the register value from heat meters: active for flow rate and heat
emission only

Set the heat meter type

- [Calec MB/ST, Multical 601, SensyCal, 2WR5](#) or [Autarkon](#): Heat meter
function enables;
- [M-Bus Meter address](#): Heat meter function enables;
set the heat meter address:
up to Firmware 2.18: 0, 1 and 3
from Firmware 2.19: 0 to 250

8.5 Power factor (Cos Phi)

Define the parameters for the calculation of cosine phi (φ).

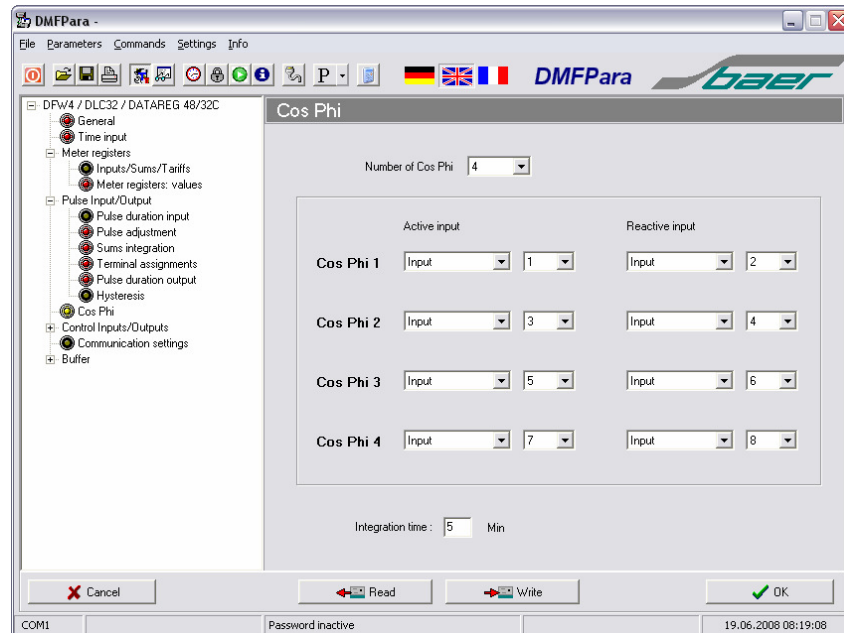


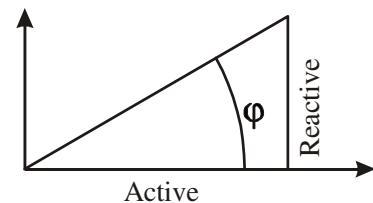
Figure 74, Cos Phi

The registration device can automatically calculate the power factor (cosine (φ)) for inputs and sums.

There are two algorithms for this calculation differing in their time basis.

1. Periodic value: The measuring period duration serves as basis for this calculation.
2. Average value: The "Integrate time" serves as the basis for this calculation

$$\text{Cos}(\varphi) = \sqrt{\frac{\text{active}^2}{\text{active}^2 + \text{reactive}^2}}$$



- **Number of Cos Phi:** Up to 4 Cos Phi (φ) are possible
- **Active input:** Define the source for the active energy. This can be either a pulse input or a summation unit
- **Reactive input:** The correlated source for reactive energy
- **Integration time:** Period of time (in minutes) over which Cos Phi (φ) is determined. Cos Phi (φ) will be updated once during each integration time independent of the period of time set
Value range: 1 min. to 60 min

8.6 Control Inputs/Outputs

Setting the parameters for control inputs

8.6.1. General ports

Setting the parameters for general ports: RSTX (reset, billing data), ABL, SYN, MRK, logical inputs and scroll button

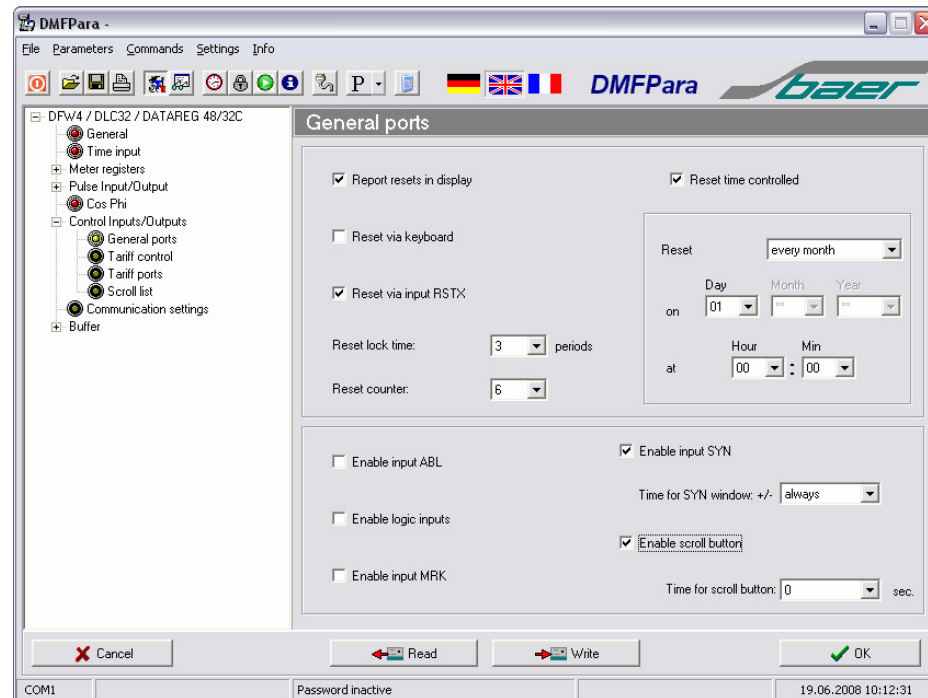


Figure 75, General ports

As an option the device can be fitted with several control inputs. Depending on the hardware version the following functions can be activated:

- **Report resets in display:** If this menu item is switched on, a resetting through a terminal switch or after time elapse (not with the keyboard) will be confirmed by a short message (e.g. "Maximum reset 01") on the telecounter's display. If this menu item is switched off, a reset will not be confirmed
- **Reset via keyboard:** If this menu item is switched on, a reset using the keyboard is possible. If this menu item is switched off, a reset via the keyboard is blocked
- **Reset via input RSTX:** When this menu item is activated, an external reset signal can be sent over the RSTX input (see the "Pin assignment")
- **Reset lock time:** Defines the period of time during which no reset can be initiated. The value can be set between 1 and 100 registration periods (value 0 is not permitted!).
- **Reset counter:** Defines the initial value for the reset counter (a value between 1 and 12). The reset counter will be increased by 1 on each reset. It rolls automatically over to the value 1. The reset counter can (as an example) be set equal to the current month.

- *Reset time controlled*: Defines the time for automatic resets;
Example: Daily reset (Enter: hour and minute)
 Weekly reset (Enter: hour, minute and weekday)
 Monthly reset (Enter: hour, minute and day)
 Yearly reset (Enter: hour, minute, day and month)
 Once (Enter: hour, minute, day, month and year)
- *Enable input ABL*: If this menu item is active, and a signal is present at the optional ABL input terminal, maximum values will not be formed
- *Enable logic inputs*: Activates the logical inputs (optional)
- *Enable input MRK*: For activation of the measurement value marking
- *Enable input SYN*: Activating this menu item activates the synchronization input terminal. If this menu item is switched off, the synchronization input does not have a function. In that case it is recommended to synchronize using a radio clock or through remote control.
- *Time for SYN window*: This will only appear when "Enable input SYN" has been selected. Here you can determine the time (max. 29 seconds := always) before and after "0" seconds of the measuring period for the duration of the active synchronization input. If you enter a value between 1 and 28 (in seconds) then synchronization to the closest full minute is only possible in this time window around the end of registration period T_m.
- *Enable scroll button*: This is for activating the scroll button (optional); see the menu „Scroll list“, page 70.
- *Time for scroll button*: Defines the period of time between automatic scrolls to the next register address in the scroll list after pressing the "0" key on the device DataFW4 / DATAREG 48 or "Enter" key on DLC32 / DLC19 / DATAREG 32C. If you set this value to "0" then automatic scrolling is disabled and the next entry in the scroll list is only displayed on the next press of the "0" key. The time is measured in seconds. The maximum time that can be defined is 240 seconds

8.6.2. Tariff control

Activating or deactivating the tariff control, the external tariff identification, the internal tariff calendars and the tariff combination

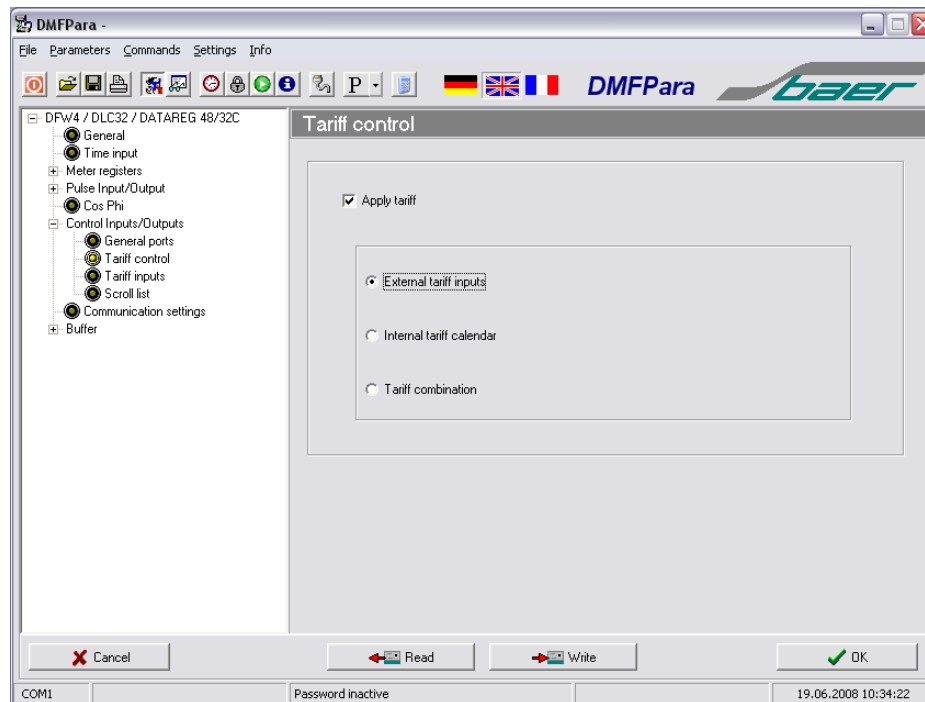


Figure 76, Tariff control

Select the control mode:

- **Apply tariff:** Activating or deactivating the tariff control
- **External tariff inputs:** Activates external control
- **Internal tariff calendar:** Activates the settings for the internal tariff calendar
- **Tariff combination:** Activating or deactivating the bit pattern tariff combination

Tariff combination computation procedure:

- 1) Internal tariff -1 = A
- 2) Conversion of A into a bit pattern
- 3) Find external tariff identification (see menu „Tariff inputs“, page 68) = B
- 4) $B - 1 = C$
- 5) Conversion of C into a bit pattern
- 6) Combination of the bit patterns for A and C using "OR logic" = D
- 7) Conversion of D into it's decimal-value
- 8) Combined tariff after the computation = $D+1$

Example: Internal tariff = 2: ET2 / MT2

External tariff = 3: ET3 / MT3 (example: TRF1 = 0, TFR2 = 1)

- 1) $2 - 1 = 1$
 - 2) $1 := 0000001$ (binary)
 - 3) 3
 - 4) $3 - 1 = 2$
 - 5) $2 := 00000010$ (binary)
 - 6) $00000001 \text{ OR } 00000010 = 00000011$
 - 7) $00000011 := 3$ (decimal)
 - 8) $\text{Tariff} = 3 + 1 = 4$
- Result: ET4 / MT4

8.6.3. Tariff inputs

Selecting inputs for the energy and demand tariff rates

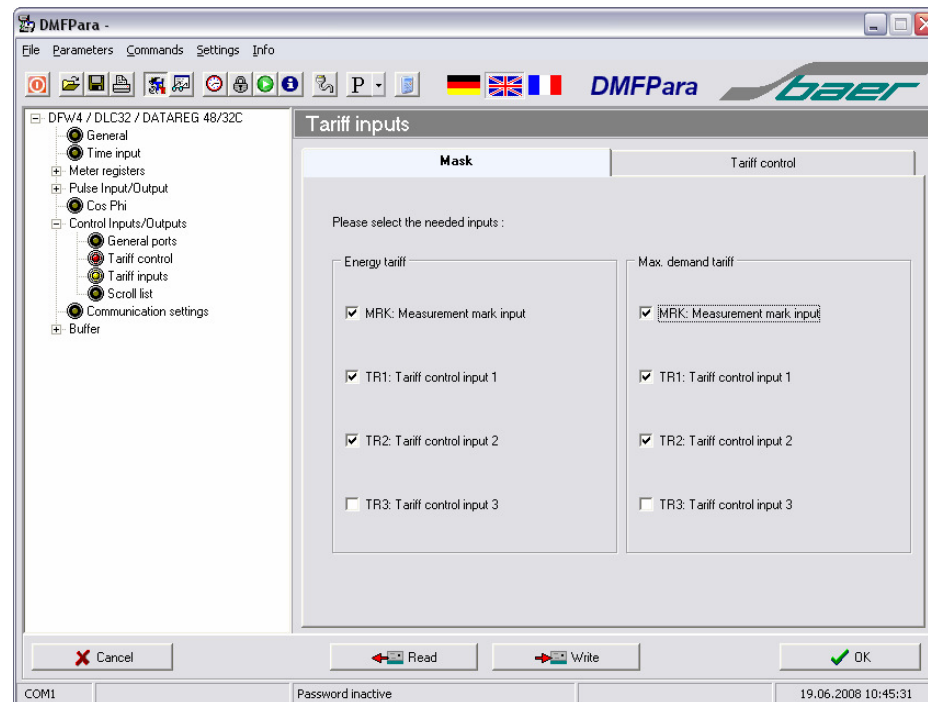


Figure 77, Tariff inputs

In this menu item, the external tariff identification will be defined only in its relationship to the external control inputs (this is only useful if the tariff rates are to be delivered over the input terminals).

- **Mask:** For selecting the inputs needed to control the energy tariff
- **Tariff control:** Each tariff identification (up to a maximum of 16 tariff identifications) can be assigned a tariff. If there are no assignments for a "Mask Energy tariff" or "Mask Max. demand tariff" (in the above graphic at TRF3) then they will be assigned a "0". Multiple port combinations are allowed for the same tariff (in the above graphic, ET and MT above left in the first and second line and all lines on the right are assigned the value "1")

Note: The instructions entered here are only active when the "External tariff sign" or the "Tariff combination" in the menu item "Tariff control" is selected.

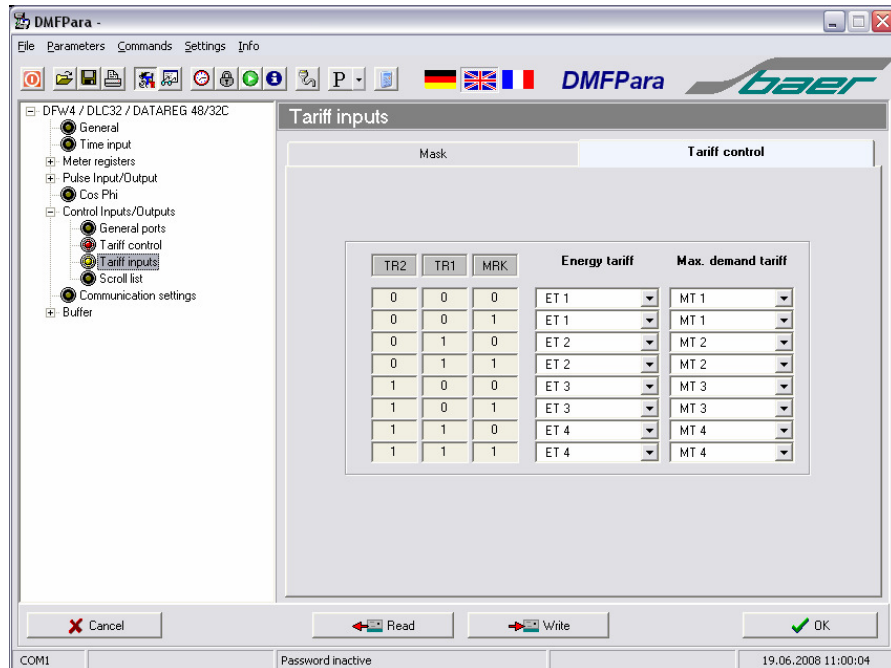


Figure 78, Tariff inputs – Tariff control

If the "External tariff inputs" is selected, then the tariff rates will be assigned through four control inputs (MRK, TRF1, TRF2 and TRF3*). These control inputs will be linked and secured in bit patterns with the basis marker byte 0A (0B by voltage interruption).

Signal weight: 0 := signal path is open (signal ON)
1 := signal path is closed (signal OFF)

The proper tariff control is dependent on the settings for the mode of operation (tariff number and the activated masks).

* if it was ordered and programmed!

Example: Tariff control for two maximum demand tariff rates and four energy tariff rates, with MRK, TRF1 and TRF2 (from the above graphic)

Note: TRF3 will be assigned the value "0" because it is not activated

The basic marker byte computation will use the following formula:

$$X = (\text{MRK}) \times 1 + (\text{TRF1}) \times 2 + (\text{TRF2}) \times 4 + (\text{TRF3}) \times 8$$

in which the setting for MRK, TRF1, TRF2 und TRF3 can be 0 or 1

If less than four tariff rates are programmed, then the highest available tariff rate will be used.

Example: Energy tariff number: 2 ↔ ET3 follows ET2 and ET4 follows ET2.

8.6.4. Scroll list

For assignment of register addresses to the scroll button list

These can be called up and displayed by pressing the telecounter's scroll button.

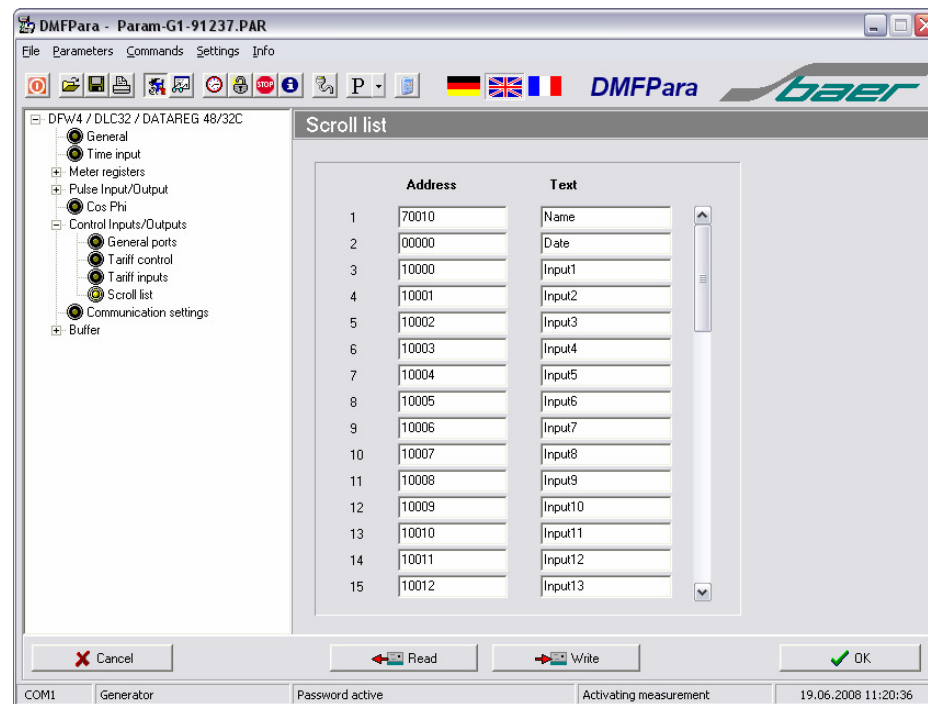


Figure 79, Scroll list

The telecounter's optional scroll button list can be programmed with up to 50 register addresses. These register addresses can be displayed by pressing the scroll button or by closing the scroll button contact.

The mask for the scroll button list is arranged in three double-columns. Make sure that entries are made in the fields in the order that the fields are numbered (field "1", field "2", field "3", etc.).

If an entry was not properly programmed an error message with the register address and, if there is enough room, the text will appear on the bottom right of the display.

Note: The scroll list can only display values for information purposes! Spaces that appear at the beginning of a text will be ignored by the program.

For telecounter's with a software version under 1.48, the "Enable scroll button" field in the "General ports" menu item must be selected in order for this item to function.

For devices with software versions of 1.48 and above the scroll button list can be called up from the standard display of the CPU through the use of the "0" key.

- **Address:** For entry of the register address whose parameters are to appear on the display when the scroll button is pressed. A list of the most useful register addresses appears on the next page. A complete list appears in "Appendix A" in the back of these operating instructions.

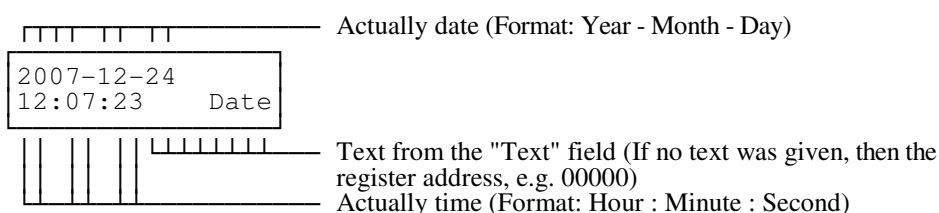
Note: Only 5 digit register addresses will be accepted. If, for example, "1234" were to be entered an error message would appear on the telecounter's display when this function is active

- **Text:** A programmable text of up to 8 characters can be entered here, for each register address in the scroll list, for devices with a software version of 1.37 and above.

Example: In field "1" under "Address" the register address "04000" (actually date / time), and in the corresponding "Text" field "Date" are entered

After the programming and the use of the telecounter's scroll button, the actually date and time and the text "Date" for the time period that was set under the "General ports / Time for scroll button" menu item will appear on the display.

The display read-out from the above example after using the scroll button:



Short list of registers addresses for the scroll list:

Time information

00000	actually date and time
01000	date and time at the end of the last registration period Tm
03000	date and time of the last voltage interruption
03100	date and time of the last voltage restoration
04000	date and time of the last resetting

Counter value (read-out)

100xx	counter value readings for total energy (xx = 00 - 79) and meter status xx = 00 - 48: counter value (00 = input 1, 01 = input 2, etc.) xx = 64 - 71: sums registers - imported (64 = sum 1, 65 = sum 2, etc.) xx = 72 - 79: sums exported
10txx	counter value reading for tariff "t" (t = 1 - 4, xx = 00 - 79) and meter status
11txx	energy since the last tariff reset "t" (current value)
120xx	total demand value at the end of the last measuring period (xx = 00 - 79) and meter status
130xx	total demand value, current value (xx = 00 - 79) and meter status
180xx	cos (φ) average value for the last minute (xx = 00 - 03)
181xx	cos (φ) average value for the last measuring period (xx = 00 - 03)
182xx	lowest cos (φ) average measuring period value since the last resetting

Maxima

40txx	maximum value and the time of its reading from demand meter "xx" (00 := input 1) at tariff "t" (t = 0 := tariff 1)
4ntxx	maximum value and the time of its reading from demand meter for the last Reset t = 0..3: maximum value and the time for tariff "t" t = 4: energy since the last tariff reset (Total) t = 5..8: energy since the last tariff reset (Tariff 1..4)

Control inputs and outputs

- 64004 reading of the reset counter and time of the last resetting
- 64010 number of resettings since the start of the measurement
- 64500 status of the LOG 0..7 inputs
- 69000 current status of the RSTX1/2, SYN, MRK, ABL, ROLL and TRF1/2/3 (32 Bit binary) inputs

Device information

- 70010 Device designation

For more addresses see the “Appendix A”.

8.7 Printer

Setting the internal or external printer (option)

8.7.1. Printer options

Setting the various printer options

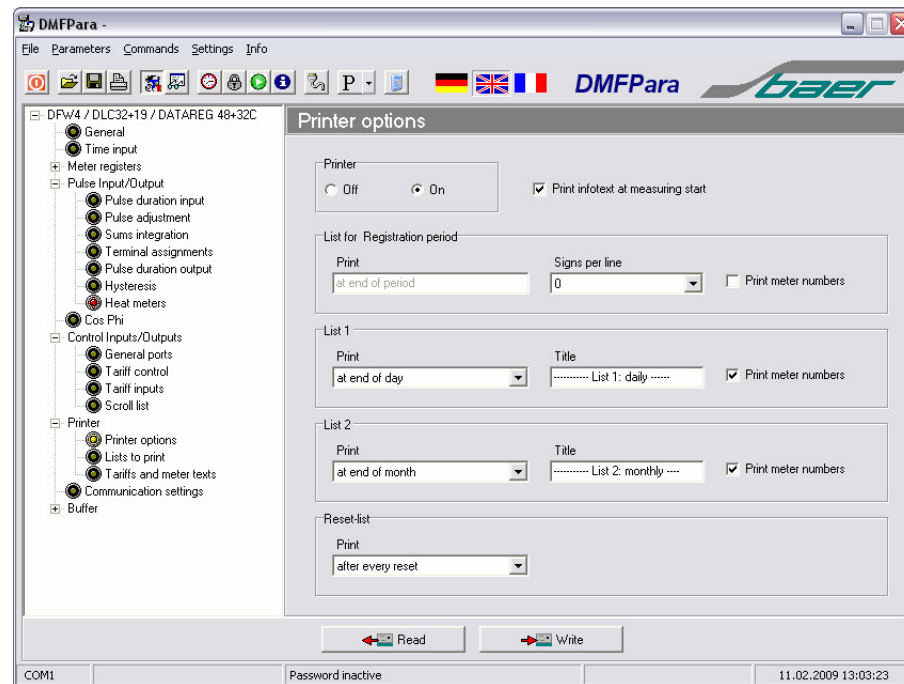


Figure 80, Printer options

- **Printer On/Off:** Switching the printer “on” or “off”.
- **Print info text at measuring start:** Prints an information text about parameter settings (meter ratios, etc.) at the start of measuring.
- **Print:** Prints the meter and sum values that are specified in the corresponding menu item (e.g. "Current energy on list 1"), on the built-in printer or on an external printer, at the specified time:
 - manual: the values will only be printed out if activated in the CPU print menu
 - at end of day: at the end of each day at 24:00 hrs
 - at end of month: on the last day of each month at 24:00 hrs
 - at end of period: at the end of each measuring period
 - after every reset: at the time of each resetting
- **Signs per line:** e.g. for external printer: 80 signs
- **Print meter numbers:** Prints the demand meter numbers of measuring period 1, the list 1 or 2
- **Title:** Text (maximum length of 32 characters) for list 1 or 2 (notes, instructions, etc.)

- **Reset list:** Prints the meter and sum values that are specified in the corresponding menu item on the built-in printer or on an external printer, at the specified time (daily, monthly, etc.).
recommended value: after every reset

Example: How to have daily and monthly lists of meter values and sums for cumulative energy printed out:

- 1) Select the "Printer" field: On.
- 2) Select the field "at end of day" under the "List 1" item.
- 3) Select the field "at end of month" under the "List 2" item.
- 4) Select other desired options from this menu (e.g. Title, info text, etc.).
- 5) Select "Cumulative energy on list 1" from the "List to print" submenu and the values that are to be printed.
- 6) Select "Cumulative energy on list 2" from the "List to print" submenu and the values that are to be printed.
- 7) Make sure that the printer is turned on.

8.7.2. List to print

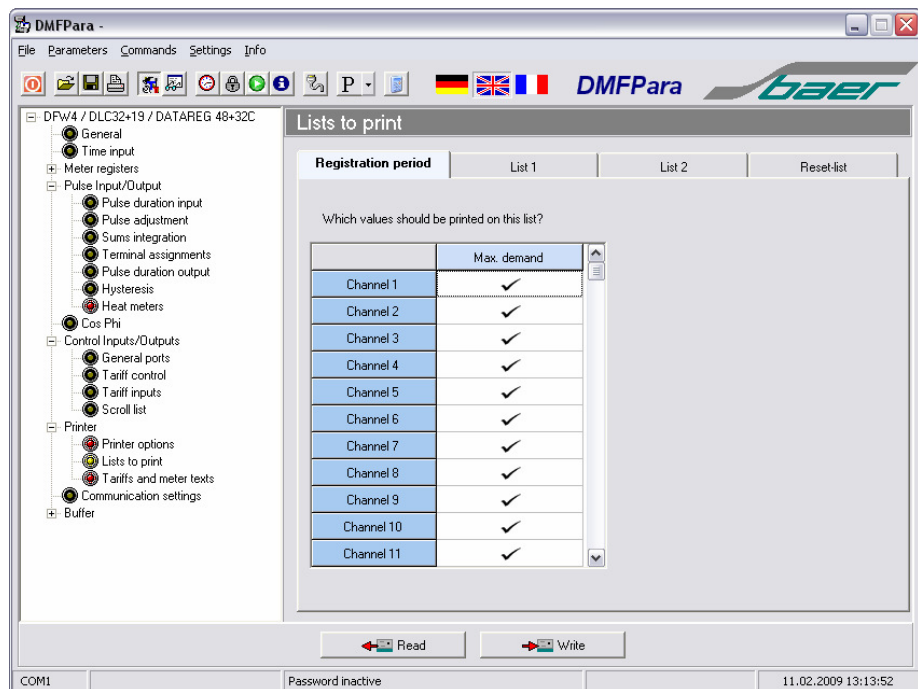


Figure 81, List to print

- **List for registration period:** Selection of the demand values and the positive and/or negative sums that should be printed at the end of Measuring period 1 (Tm1/MP1)
- **List 1 / List 2 / Reset-list:** Selection of the energy values and positive / negative sums that should be printed in list 1, 2 or reset-list:
 - **Accumulative energy:** The amount of energy registered (or measured) by an input since its activation.

- **Current energy:** The amount of energy registered (or measured) by an input or register since the start of measurement (or the last reset: billing list)
- **Max. demand:** Contains the average demand values per registration period in physical units (e.g. MW, kvar, etc.).

Select the column for which you want to mark by a click on the top of the line:

Which values should be printed on this list?

	Accumulative energy	Current energy	Max. demand
Channel 1		✓	
Channel 2		✓	
Channel 3		✓	
Channel 4		✓	
Channel 5		✓	
Channel 6		✓	
Channel 7		✓	
Channel 8		✓	
Channel 9		✓	
Channel 10		✓	
Channel 11		✓	

Figure 82, mark a column

Select the input for which you want to mark a click on the left site of the line:

Channel 2			
Channel 3	✓	✓	✓
Channel 4			

Figure 83, Mark a line

8.7.3. Tariffs and meter texts

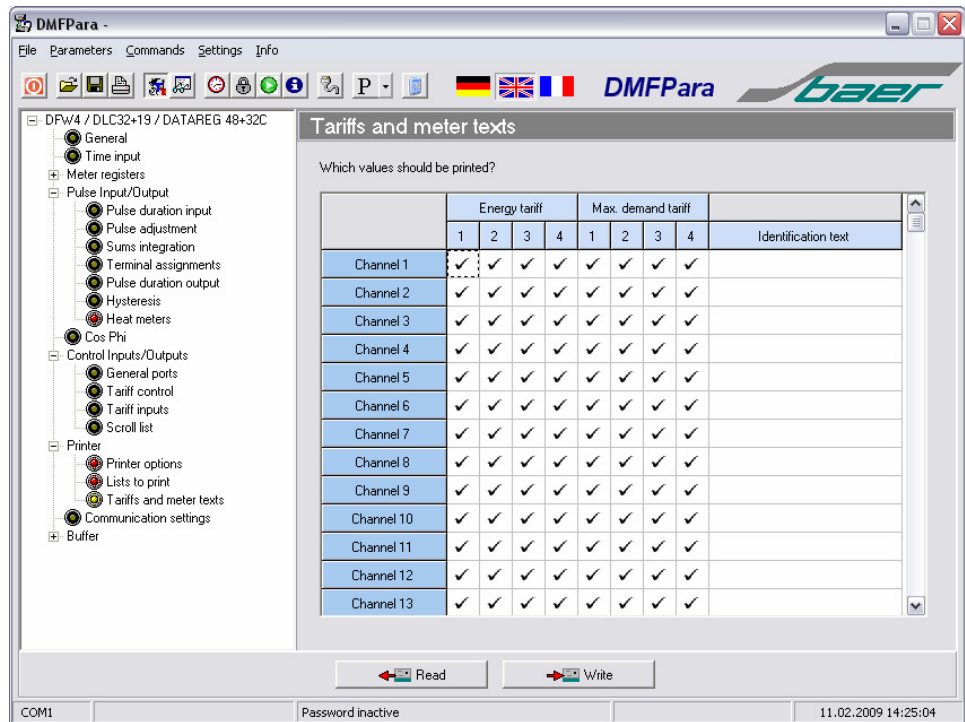


Figure 84, Tariffs and meter texts

- **Energy tariff:** Selection of the energy tariffs that should be printed out with the input or sum
- **Max. demand tariff:** Selection of the demand tariffs that should be printed out with the input or sum
- **Identification text:** Edit of a text that should be included (e.g. "Energy in kWh") when the corresponding input or sum selected in the "List" field is printed (maximum of 25 characters)

Select the input for which you want to mark a click on the left site of the line:



Figure 85, Mark a line

Select the column for which you want to mark by a click on the top of the line:

Which values should be printed?

	Energy tariff				Max. demand tariff				
	1	2	3	4	1	2	3	4	Identification text
Channel 1	☒				☒				
Channel 2	☒				☒				
Channel 3	☒				☒				
Channel 4	☒				☒				
Channel 5	☒				☒				
Channel 6	☒				☒				
Channel 7	☒				☒				
Channel 8	☒				☒				
Channel 9	☒				☒				
Channel 10	☒				☒				
Channel 11	☒				☒				
Channel 12	☒				☒				
Channel 13	☒				☒				

Figure 86, mark a column

8.8 Tariff calendar

For setting the four internal tariff calendars

Note: You must select the item “Internal tariff calendar” in the dialog “Control inputs/outputs – Tariff control” to activate the internal tariff calendar; see page 66:

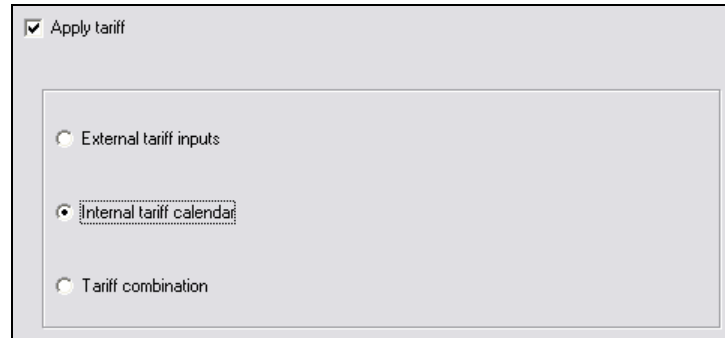


Figure 87, Tariff control

8.8.1. Tariff calendar 1

You can use the dialog “Tariff calendar” to define the device internal switching times for the various tariff rates. This dialog allows you to create a number of different rate tables for different periods of time (e.g. summertime and wintertime) for one whole year.

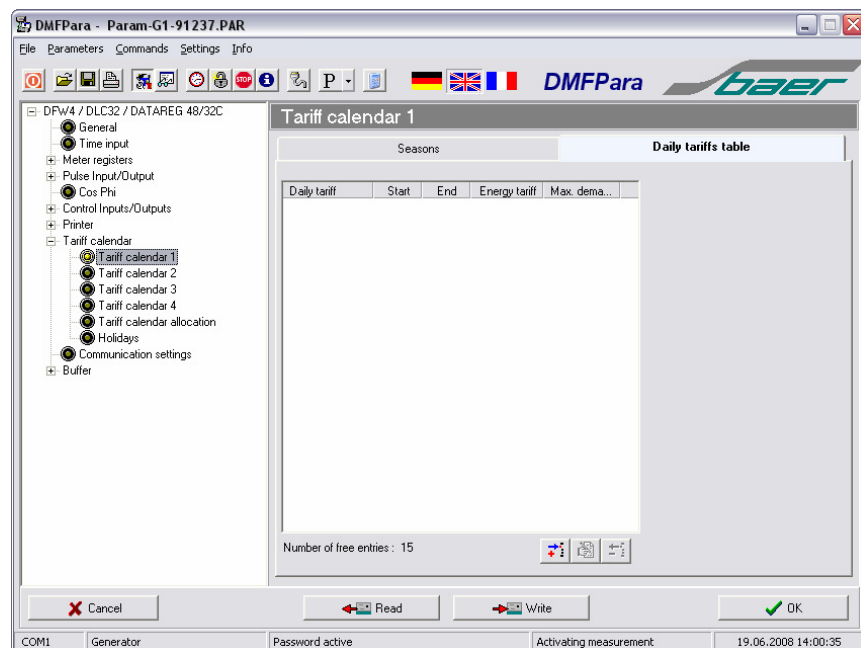


Figure 88, Tariff calendar

Example: The following example will be used make these settings

For two time periods (summer and winter), each with different switching schedules for two energy and two demand tariffs (Day tariff - T1, and Night tariff - T2).

Day tariff T1:	Season	Summer	Winter
	Time period	01. April - 30. Sep.	01. Oct. - 31. March
	Mo–Fr (T1):	06:00 - 21:00	06:00 - 18:00
	Sa (T1):	06:00 - 13:00	06:00 - 13:00

Night tariff T2: all other times

Holidays: Holiday type 1: Night tariff plan - T2 for all full holidays
 Holiday type 2: Saturday tariff plan (Day tariff T1 from 06:00-13:00).

Day tariff tables

Up to 15 tariffs can be defined here.

Four different day tariff tables are to be set in this example.

- Day tariff 1: Monday-Friday (Summer)

T2	00:00 - 06:00
T1	06:00 - 21:00
T2	21:00 - 00:00
- Day tariff 2: Monday-Friday (Winter)

T2	00:00 - 06:00
T1	06:00 - 18:00
T2	18:00 - 00:00
- Day tariff 3: Sunday and holyday type 1

T2	00:00 - 00:00
----	---------------
- Day tariff 4: Saturday and holiday type 2

T2	00:00 - 06:00
T1	06:00 - 13:00
T2	13:00 - 00:00



The first step is to open the "Daily tariffs table" window by selecting the button.

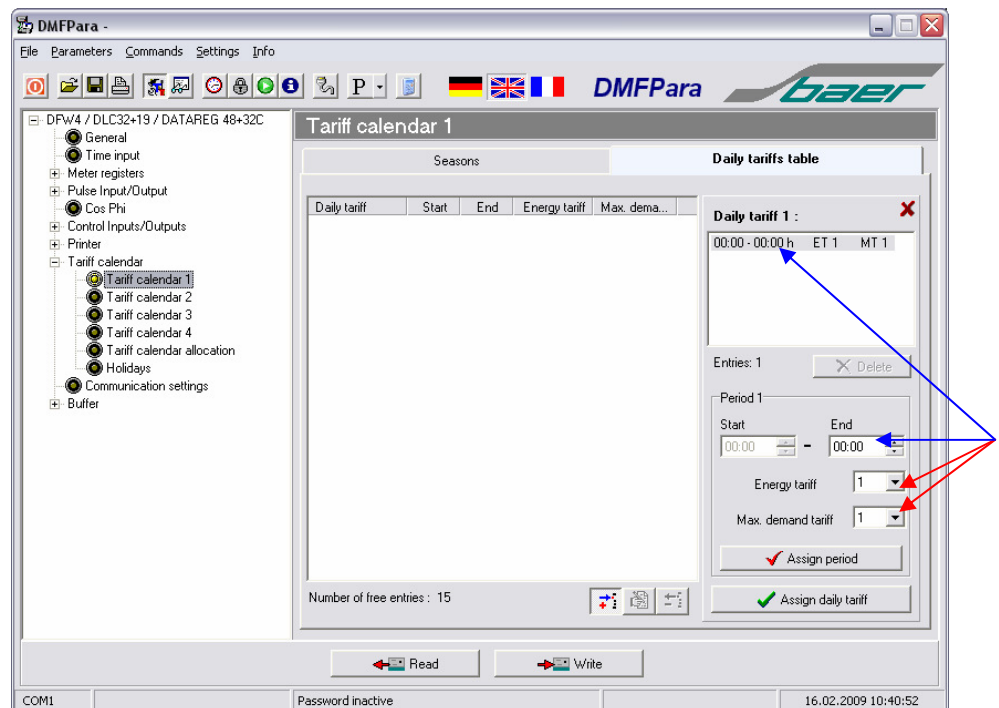


Figure 89, Daily tariffs table

Entry of the first day tariff:

Note: All of the time entries within one day begin and end with "00:00". Gaps (e.g. "start", "end") will be automatically filled by the program, but this can lead to errors. It is best when the complete control that is available to the customer is planned and defined here.

Select the "end" time field and enter "06:00". Set both tariffs to 2: →

✓ Assign period

The next step is to click "Assign period". The first time period for the first day has now been set. There are two more time periods to be set for this first day classification. Select the corresponding "end" field and enter 21:00 for the next time period (tariff 1). Click "Assign period". The second time period for the first day has now been set. Go to the third period and set the tariffs to 2 ("end" time field = 00:00). Click "Assign period".

Daily tariff 1 :			
00:00 - 06:00 h	ET 2	MT 2	
06:00 - 21:00 h	ET 1	MT 1	
21:00 - 00:00 h	ET 2	MT 2	

Figure 90, Daily tariffs table

✓ Assign daily tariff

The next step is to click "Assign daily tariff". The first day has now been set.



Repeat the process from the first day tariff entries making sure that the entry in the "Daily tariff" field corresponds to the new information that is to be entered. Use the button  for selection of the next daily tariff.

When all of these entries are complete you see the following table:

Tariff calendar 1					
Seasons			Daily tariffs table		
Daily tariff	Start	End	Energy tariff	Max. dema...	
Daily tariff 1	00:00	06:00	2	2	
	06:00	21:00	1	1	
	21:00	00:00	2	2	
Daily tariff 2	00:00	06:00	2	2	
	06:00	18:00	1	1	
	18:00	00:00	2	2	
Daily tariff 3	00:00	00:00	2	2	
Daily tariff 4	00:00	06:00	2	2	
	06:00	13:00	1	1	
	13:00	00:00	2	2	

Figure 91, Daily tariffs table

Seasons

For setting the seasons (and other time periods with special tariffs or other special requirements) select the "Seasons" field.

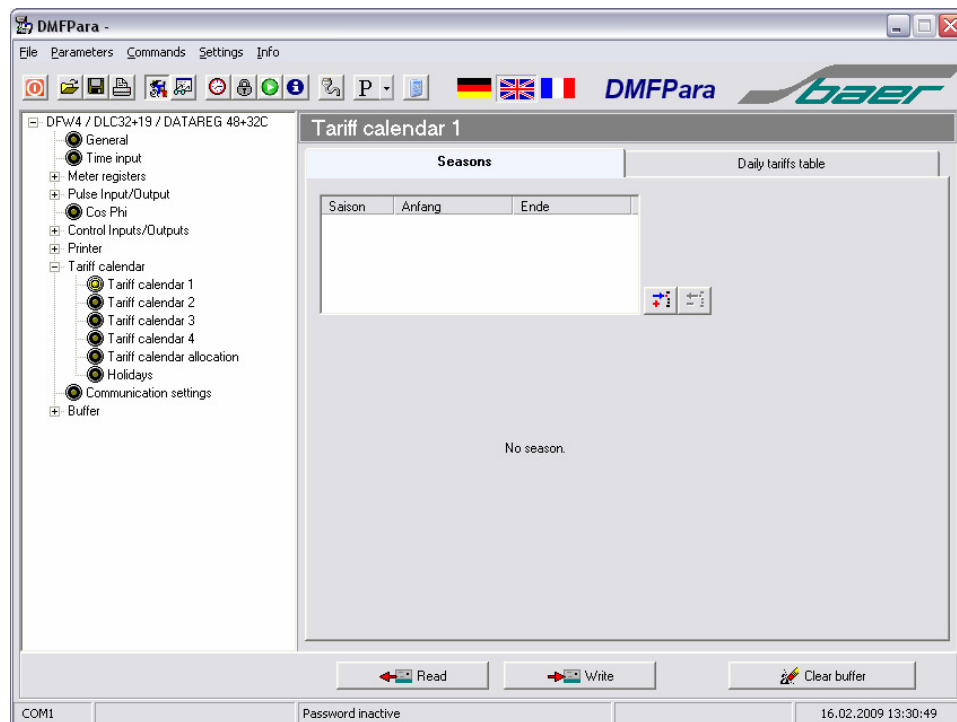


Figure 92, Seasons table



Open the season definition window.



Edit period

To define the first time period select the "Edit period" field. Then select the "Start Season" field and enter the desired date which, for our example, is "01. April". Next select the "End Season" field and enter "01. October". Season 1 for the first tariff calendar has now been defined to begin on the 1st of April (at 00:00) and end on the 30th of September (1st of October at 00:00).

Figure 93, Seasons table

Note: The season definitions are always on the basis of the calendar year (1st of January to 31st of December). If the season definitions are not inclusive, then the program automatically fills the gaps in the dates, and sets a season change for the end of the year (at 00:00), unless the six available seasons have already been set.

Figure 94, New season

Answer with "Yes" and you get automatically the second season:

Saison	Anfang	Ende
Season 1	01.04 (00:00 h)	01.10 (00:00 h)
Season 2	01.10 (00:00 h)	01.04 (00:00 h)

Figure 95, Two seasons

Coordination of season. The default value is "Daily tariff 1" for all days.



Figure 96, Week tariff

Continuing with our example select the "Season 1" (for "01.04 to 01.10") in the Season field. Then select "Monday" in the "Week tariff Season 1" field. With the selection of the "Daily tariff 1" in the "Day tariff" field the proper time and tariff assignments (00:00 to 06:00: Tariff 2, 06:00 to 21:00: Tariff 1, 18:00 to 00:00: Tariff 2) have now been made. Since the day tables are the same for Monday through Friday, the same procedure is to be followed after selecting the "Tue - Thu" field and then again after selecting the "Friday" field. Next comes the coordination for Saturday. Select "Saturday" in the "Week tariff Season 1" field and then select "Daily tariff 4" (00:00 to 06:00: Tariff 2, 06:00 to 13:00: Tariff 1, 13:00 to 00:00: Tariff 2). To coordinate for Sunday select "Sunday" and then the "Daily tariff 3" (00:00 to 00:00: Tariff 2). The tariff assignment for public holiday 1 ("Holiday 1") is the same as for Sunday ("Daily tariff 3"), and for public holiday 2 ("Holiday 2") is the same as for Saturday ("Daily tariff 4").

The coordination for the season 1 is now complete (see the graphic line).

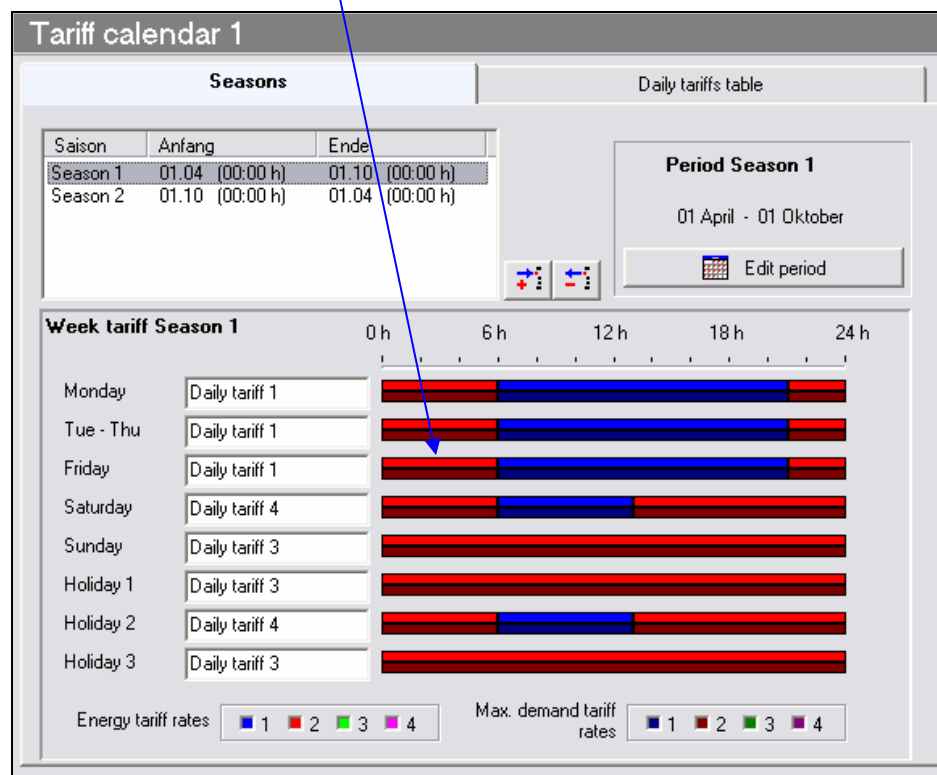


Figure 97, Season 1

Repeat the steps described above except in that the "Season 2" is to be selected (01.10 to 01.04).

Set "Daily tariff 2" for Monday through Friday:

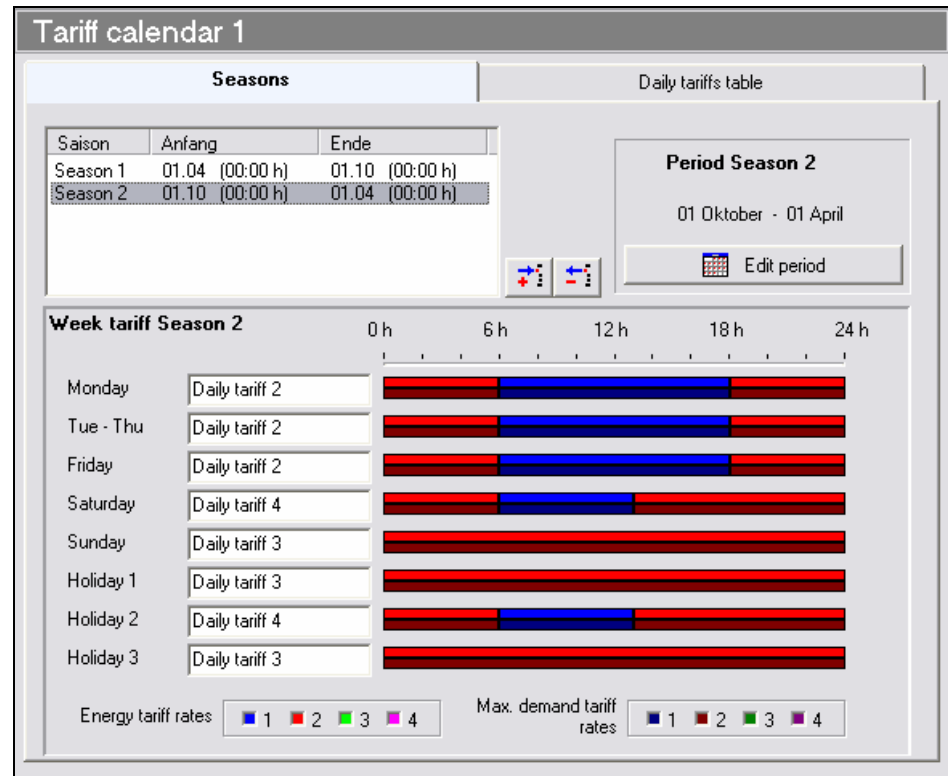


Figure 98, Season 2

Our example for "Tariff calendar 1" is now complete.

8.8.2. Tariff calendar allocation

Assignment of inputs and sums registers to tariff calendars.

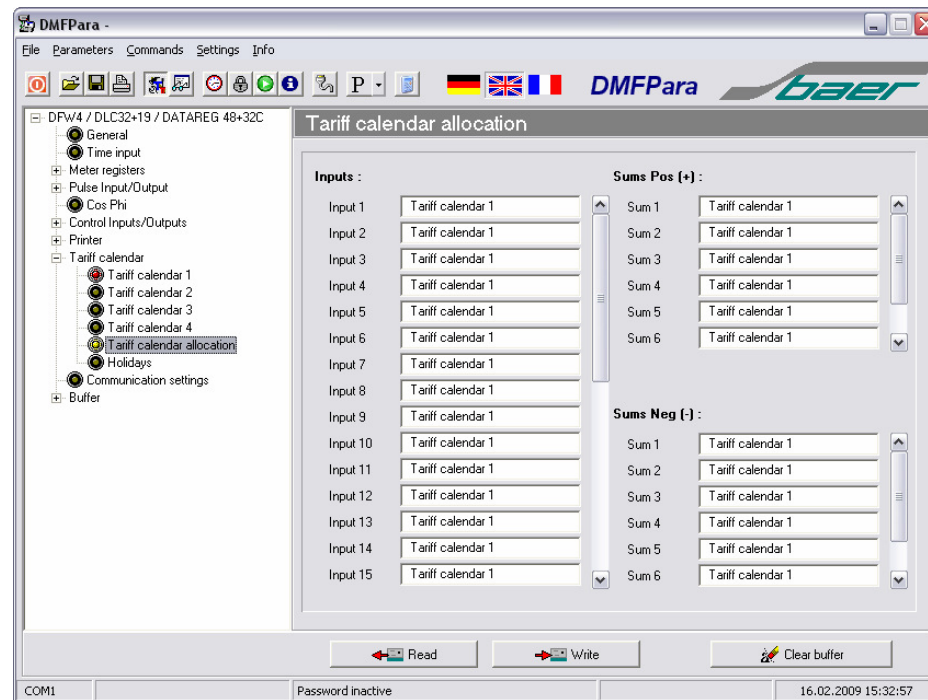


Figure 99, Tariff calendar allocation

Each of the four tariff calendars can have inputs and/or sums registers assigned to it. Unless changes are made they are all automatically assigned to “tariff calendar 1”. To make assignments to other tariff calendars select the input or sum and the “Tariff calendar”:

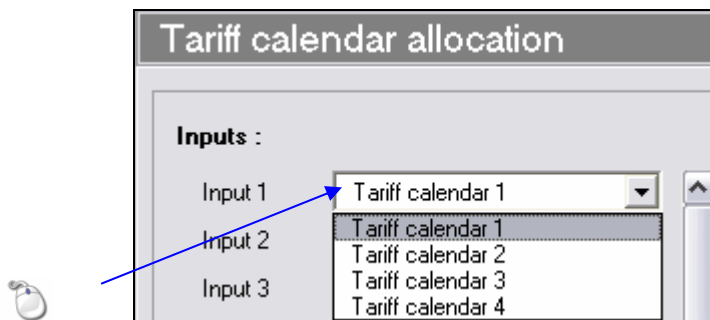


Figure 100, Tariff calendar allocation

8.8.3. Holidays

Defining the public holidays.

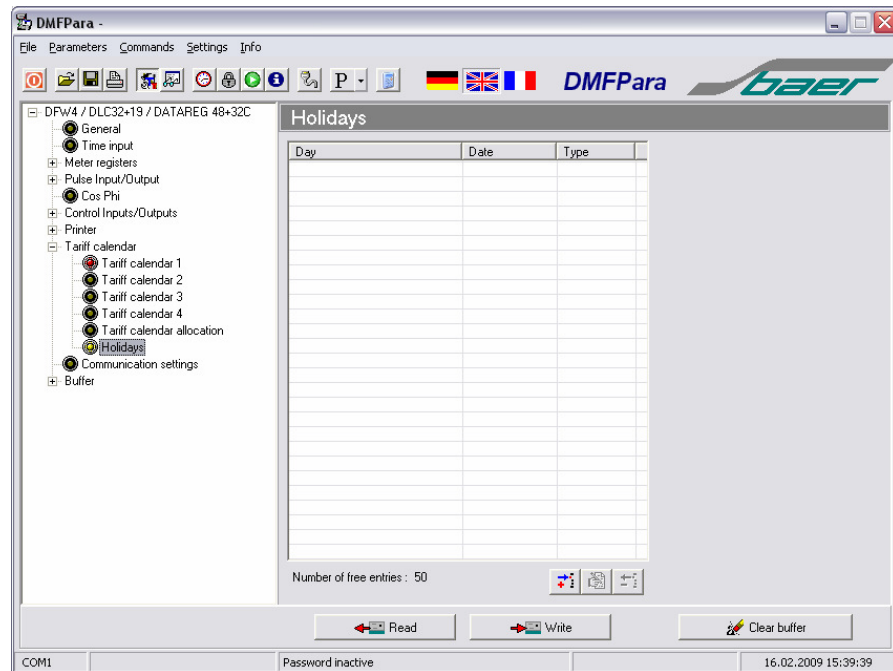


Figure 101, Holidays



Click on the button “Add holidays” and enter the date or use the program wizard.

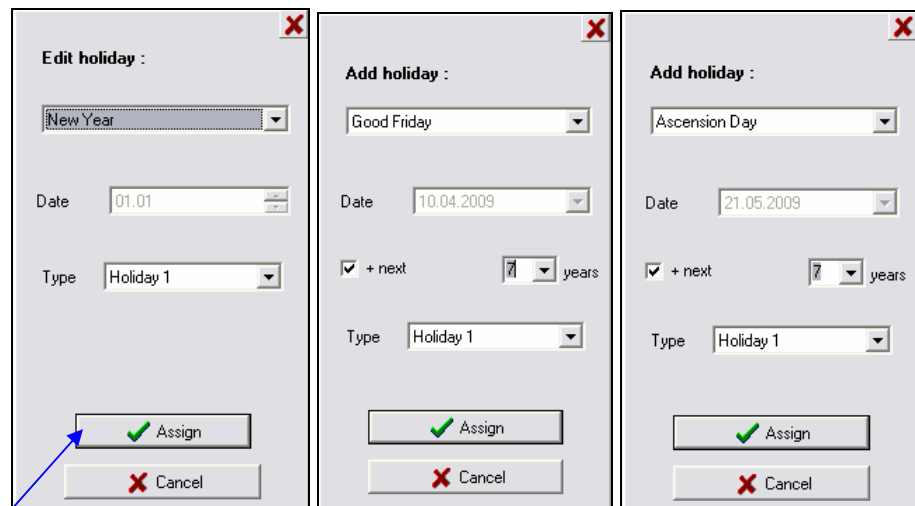
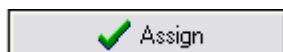


Figure 102, Holidays: example

Then select the holiday tariff type for every holiday in the "Type" field (in our example: “Holiday 1”).



Click the “Assign” field.

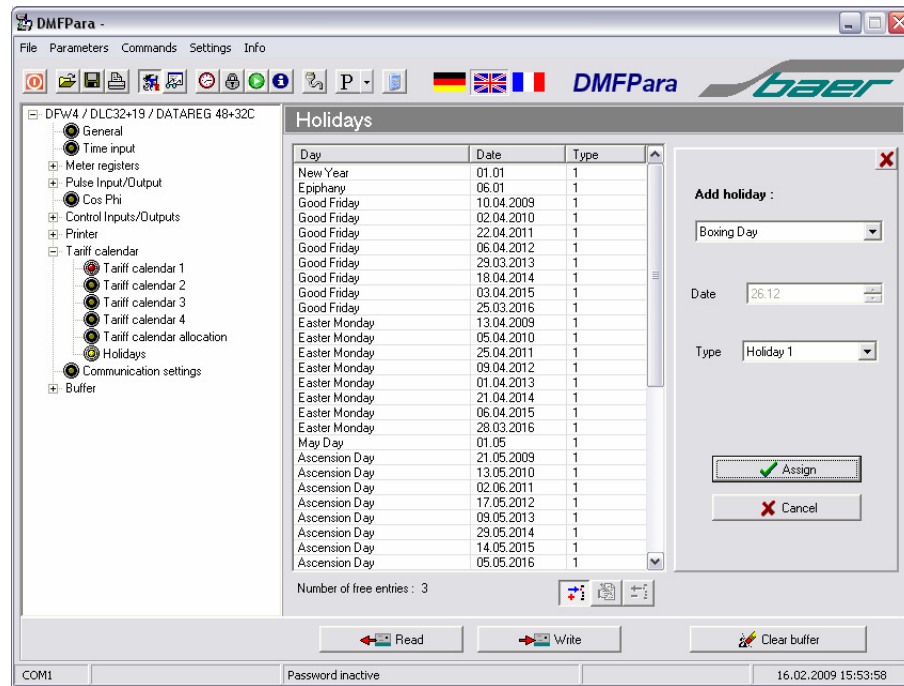


Figure 103, Holidays

Note: Up to 50 different holidays can be programmed. For public holidays that come every year and have a set date (e.g. New Years, May Day) you need only one entry.

8.9 Communication settings

Define the parameters for transmissions between the registration device and the information relay interface (e.g. modem)

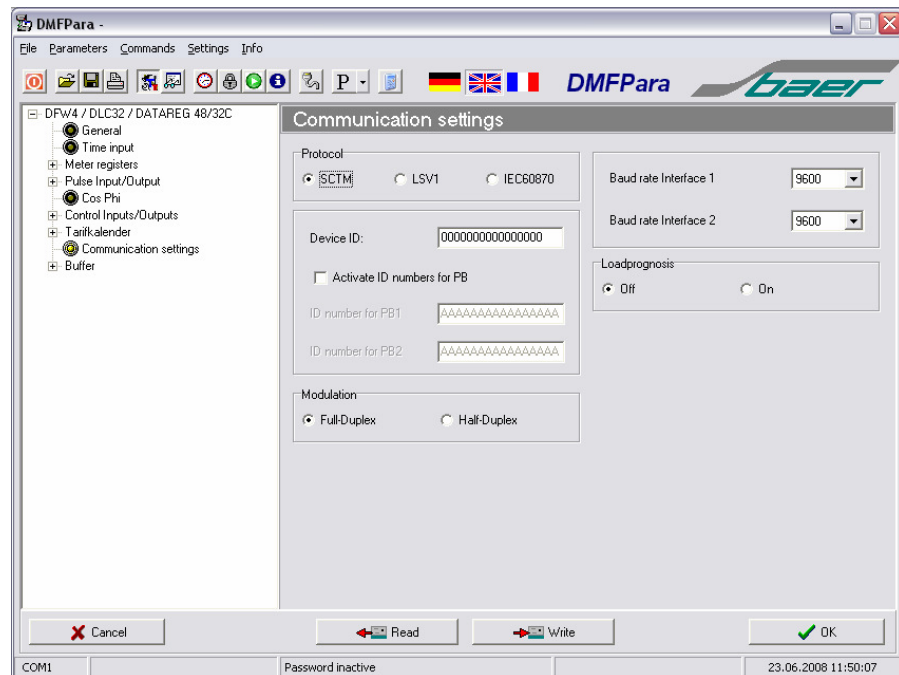


Figure 104, Communication settings

- **Protocol:** For selection of the desired protocol: SCTM (Serial Coded Telemetry), LSV1 or IEC60870-5-102.

Parameters for SCTM and LSV1:

- **Device ID:** For setting the internal equipment identification number using the numeric keys. The number may have up to 16 digits.
The first 5 digits are for the outstation number in the SCTM protocol.
The first 8 digits are for the outstation number in the LSV1 protocol
- **Activate ID numbers for PB:** Activation of the memory IDs (periodic buffers).
- **ID number for PB1/2:** Enter an additional unit identifier for the periodic buffer 1 or 2 (16 digits).

Parameter for IEC60870-5-102:

- **Address:** Device address (Link address), length 2 bytes;
Link address = ASDU address;
Parameters for data retrieval, all values in decimal notation (0 to 65535) or hexadecimal notation (0000 to FFFF_{hex}).
Each registration device **must have** a clear and individual link and ASDU address for proper data transfer.

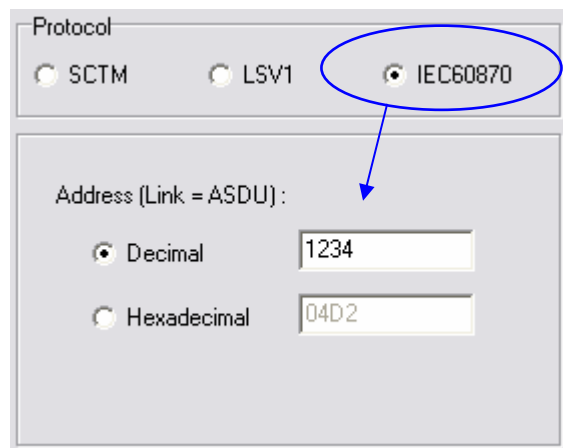


Figure 105, Communication parameters: Protocol IEC 60870-5-102

- **Modulation:** For setting the modem for Full-Duplex or Half-Duplex

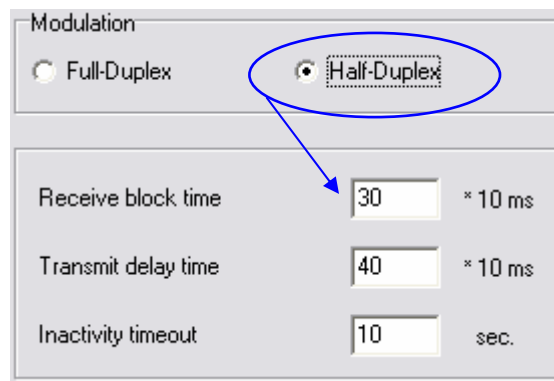


Figure 106, Communication parameters: Modulation Half-Duplex

Parameters for Half-Duplex:

- **Receive block time:** For setting the time which must elapse after transmission of the last character and before the RTS line can be switched off. (Value range: 3 - 255 in 10ms units)
Recommended setting: "30" (or 300ms)
- **Transmit delay time:** For setting the time which must elapse between switching of the RTS line from OFF to ON and the CTS line from OFF to ON (Value range: 3 - 255 in 10ms units).
Recommended setting: "40" (or 400ms)
- **Inactivity timeout:** For setting the length of time that can pass without signals being sent or received after which the modem will disconnect itself (Value range: 10 - 15300 in seconds).
Recommended setting: "10" (or 10 seconds)

Note: Each time that the registration device is restarted (factory settings) the receive block time, the transmit delay time and the inactivity timeout are set to zero. If either the receive block time or the transmit delay time are set to

zero, then full-duplex modulation (RTS will be set once and remain set) will be used. For this, however, the modem must also be set for full-duplex (see the modem switch settings). In the case that half-duplex is desired then the values for both receive block time and transmit delay time must be larger than "0". The switches on the modem must be set to allow for half-duplex modulation. The other unit hardware must also be appropriately supplied and set.

For further information please see the modem manual.

- *Baud rate Interface 1 and 2:* Transmission speed for Com1 and Com2 at the data logger
- *Load prognosis:* For setting the load prognosis parameter:
 - *Station address:* The addresses from 1 to 254 are acceptable.
 - *Baud rate:* Transmission speed
 - *Number of values:* Number of sums registers to be used for the transmission of values
 - *FCB/FCV Bit invert. (DIN19244):* FCB/FCV Bit is DIN19244-conform (first version)

8.10 Periodic Buffers

All data can be stored in two periodic buffers PB1 and PB2.

8.10.1. Buffer 1 and 2

For assignment of Input, positive Sums and negative Sums data that should be stored in either or both of the periodic buffers

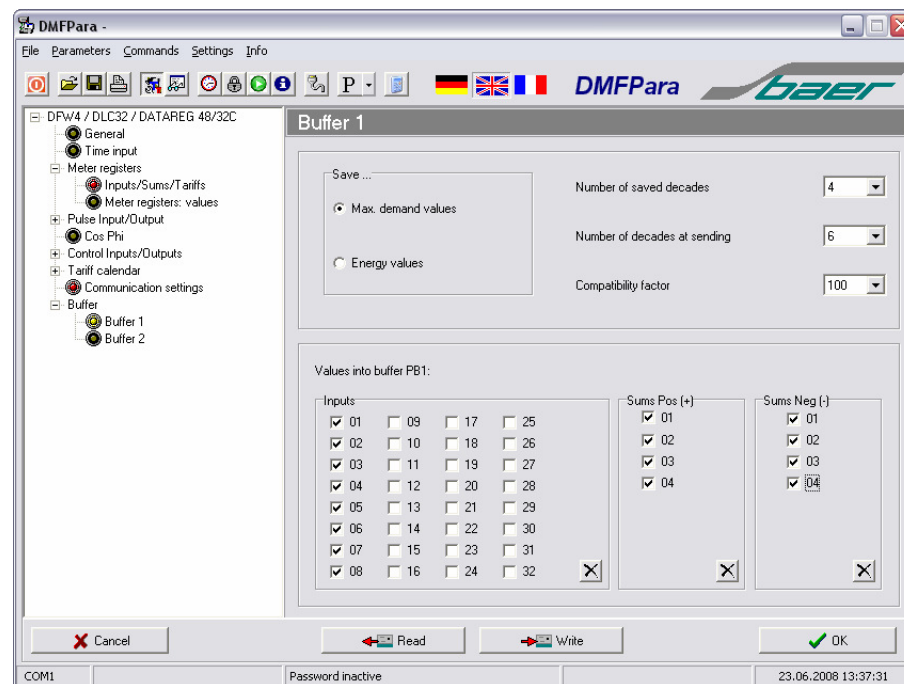


Figure 107, Periodic Buffer 1

Note: **Up to 16 values** (inputs and sums registers) can be saved in each of the two periodic buffers.

- **Save:** Select the type of values to be stored and transmitted for periodic buffer 1 or 2: maximum demand values (e.g. kW) or energy values (e.g. kWh)

Note: Internal calculates the device for the maximum demand values with 4 digits only!

- **Number of saved decades:** Select the length (number of digits) of values stored for periodic buffer (one decade = one digit). **For maximum demand values you can set 4 decades only!**
- **Number of decades at sending:** Select the length (number of digits) of values transmitted for periodic buffer (one decade = one digit)

- **Compatibility factor:** The read out compatibility factor (multiplier) is provided to facilitate measurement reading from older units that have software versions smaller than V5.00 (when equipped with a FC01-, VU25- or VU26-card), or smaller than V6.00 (when the MSC01 card) is used.

If the factor is set at "1", then the simple values will be right-justified and then displayed. If the factor of "100" is selected, then the values will first be multiplied by 100 before they are right-justified and displayed.

Example:

Value	Decades	Compatibility factor = 1	Compatibility factor = 100
1 2 3 4	4	1 2 3 4	3 4 0 0
	6	0 0 1 2 3 4	1 2 3 4 0 0
	8	0 0 0 0 1 2 3 4	0 0 1 2 3 4 0 0
1 2 3 4 5 6	4	3 4 5 6	5 6 0 0
	6	1 2 3 4 5 6	3 4 5 6 0 0
	8	0 0 1 2 3 4 5 6	1 2 3 4 5 6 0 0

- **Inputs:** Select the inputs that must be stored in the selected periodic buffer. For reasons of compatibility only data from Inputs 1 through 32 can be transferred to the periodic buffers.
- **Sums:** Select the summation units that must be stored in the selected periodic buffer. For reasons of compatibility only data from the first four sums registers can be transferred to the periodic buffers if the "Sums difference" field in the "Input/Sums/Tariffs" item under the "Meter registers" menu item is selected. Otherwise the data from all eight sums registers is available to the periodic buffers.

Note: The masks and the functions of periodic buffer 1 and buffer 2 are the same.

9 Menu Device Parameterization “7FMS1 / Data Logger”

You should perform a unit restart (to factory default settings) before programming a device. Changes to some of the parameters will trigger automatic erasure of the load profile memory.

The relevant unit ID must be entered correctly before changing any parameters in the registration device, otherwise the unit will not change the parameters and will display a corresponding error message (factory default setting: **00000**).

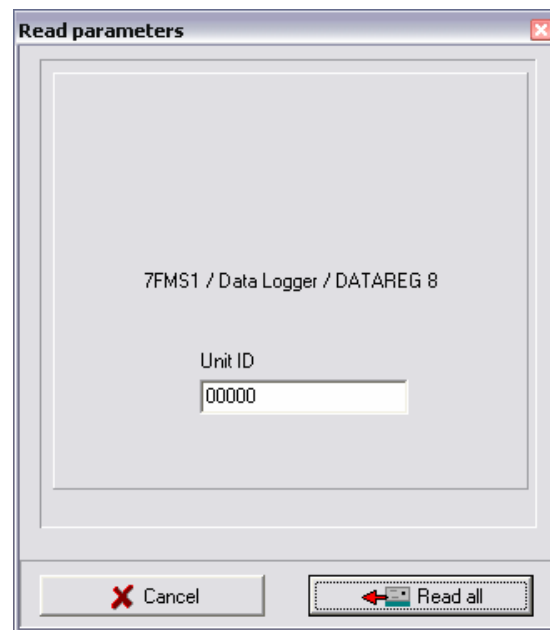


Figure 108, Set Unit ID

Important: You should read the parameters and the stored data from the connected unit before you change the parameters!

The device can be programmed in the following ways:

1. “Online-programming”: individual parameters are sent directly from the relevant dialog windows to the data logger by using the action button “Write” after having been modified.
2. By using the menu item “Write all parameters”.

Please proceed as follows:

- Connect the service interface of the device with a free COM port of your PC using a programming cable.
- Create or open a parameter file (extension “.PAR”).
- Enter the valid unit ID (SCTM-protocol).
- Program the device (menu item or button “Write all parameters”).

9.1 General

Show and set the general parameter:

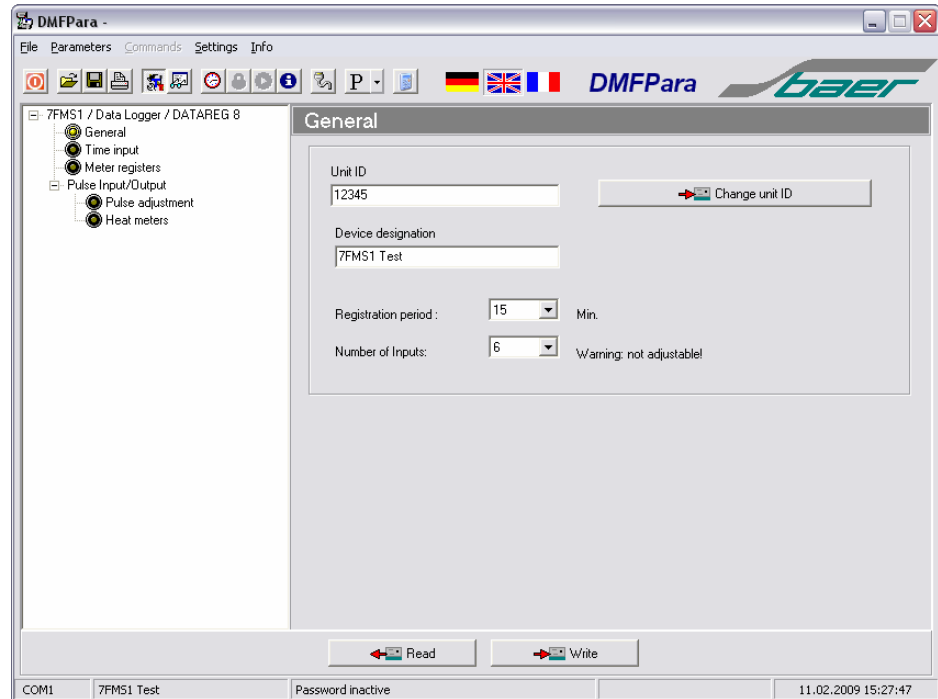
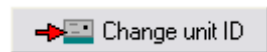


Figure 109, General

- **Unit ID:** Edit the correct “unit ID” for communication with the device
- **Device designation:** A label for the registration device can be assigned here that will be displayed over the use of the scroll button (address: 70010).
- **Registration period:** Definition of the length of registration period (2-60 Minutes).
- **Number of Inputs:** Definition of the total number of active inputs/channels (needed for following parameterization). In the device is the number of inputs fix and not adjustable (Firmware).



Change unit ID: Edit five (5) digits unit identification (SCTM-Address).

9.1.1. Change unit ID

Edit the new unit ID.

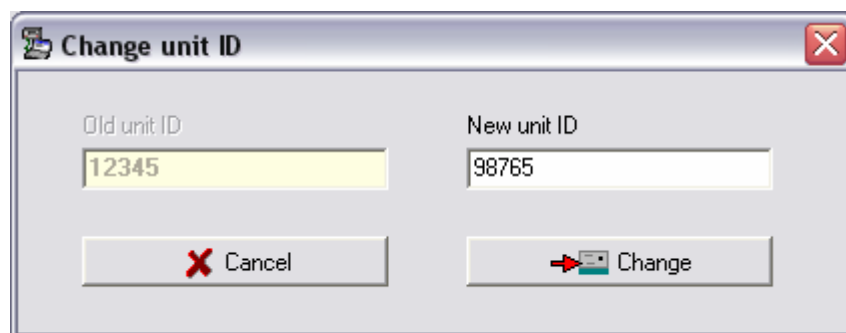


Figure 110, Change unit ID

Note: The new unit ID will be automatically updated in all menus
Factory default setting: **00000**
It isn't possible to read the unit ID from the device!

9.2 Time input

Set the time.

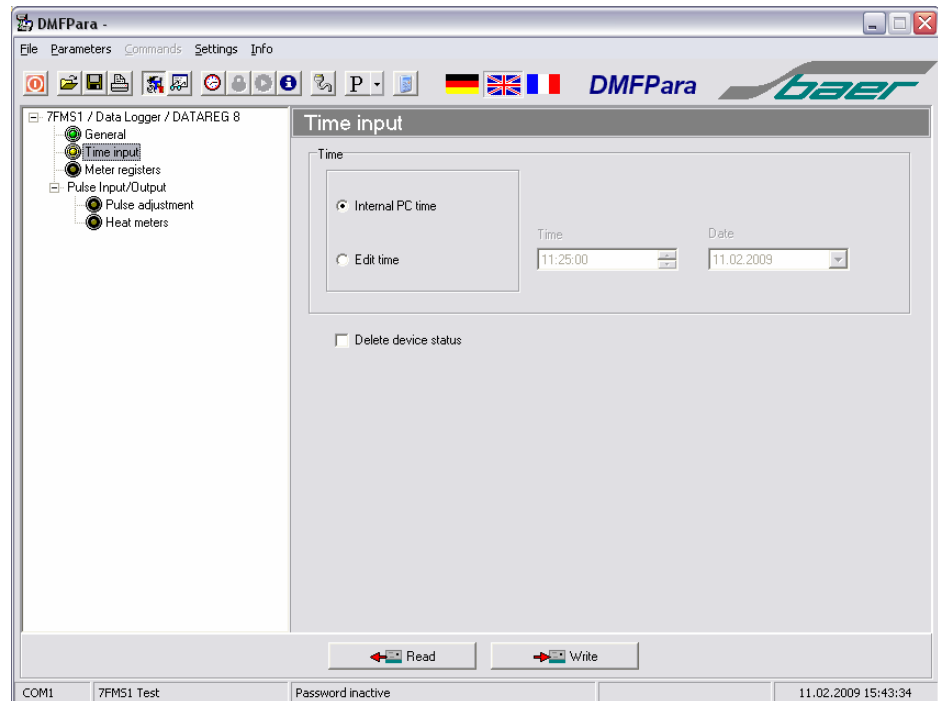


Figure 111, Set time

- **Internal PC time:** The device will be set to the current date and time of the PC where the programming software is installed:
possible only when second := 0



Figure 112, Set time by second 0

- **Edit time:** The device will be set to the values entered into the fields "Date" and "Time" at the time of setting (second := 0)
- **Delete device status:** The device status will be deleted (address 70011 or 051xx)

9.3 Meter registers

For setting the initial value for the input/channel (8 digits)

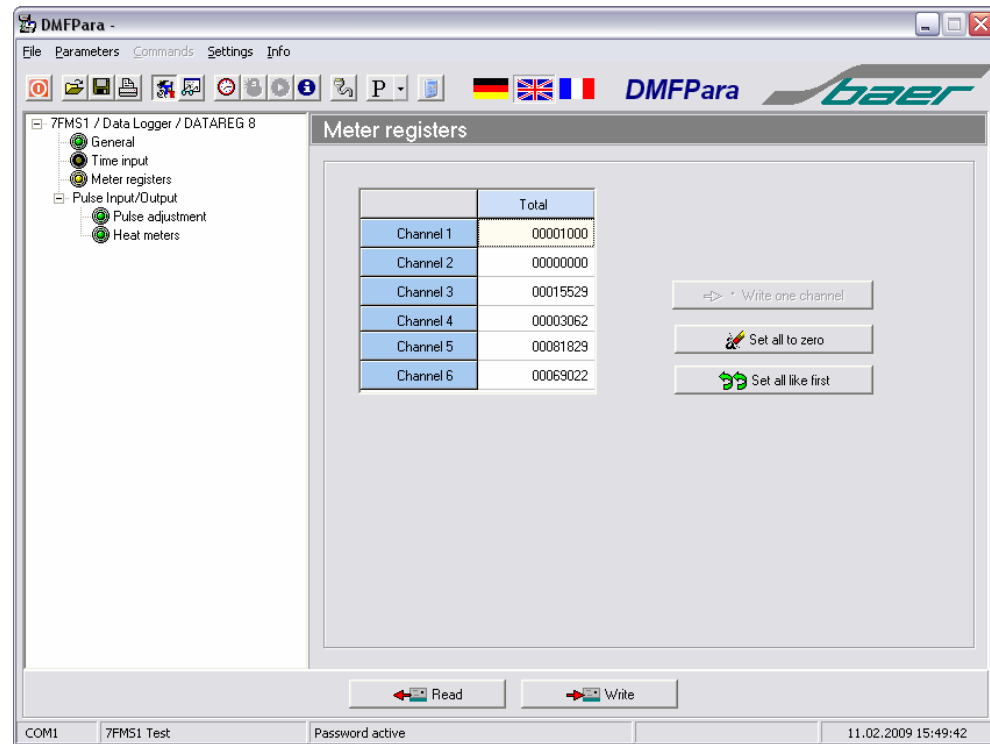
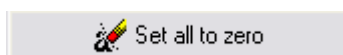


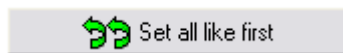
Figure 113, Inputs

A meter register reading of 00000000 is also allowed.

Note: If the menu item "Read" was selected and the "Counter value" was activated, then the value at the time of the last meter reading will appear here after the selection of the counter



Sett all inputs/channels to „00000000“



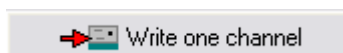
Set all inputs/channels to value like first input.

Select the counter for which you want to adjust the energy value by a click on the left site of the line:



	Total
Channel 1	2000
Channel 2	00000000

Figure 114, Select an input



Write the values for one input.

9.4 Pulse adjustment

Definition of the numerator and denominator of individual inputs depending on meter constants, transformer ratios and reading constants

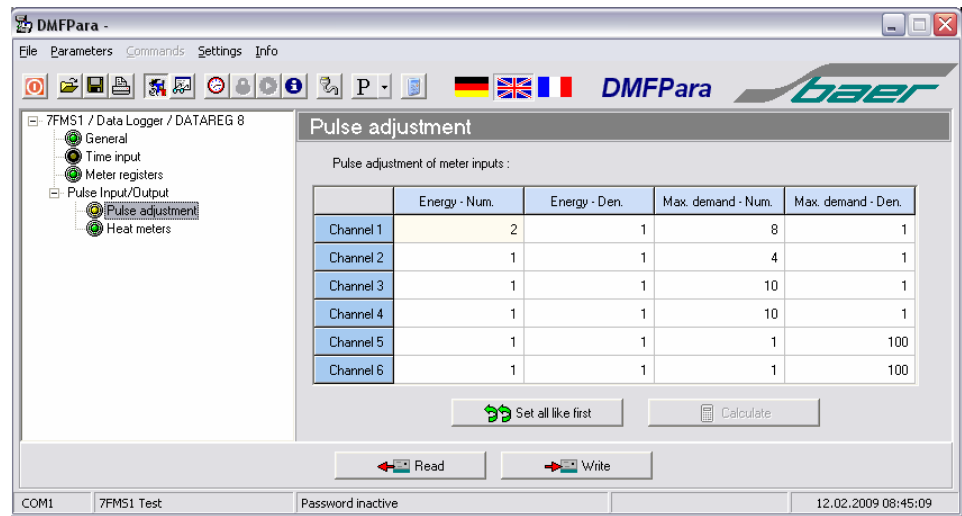


Figure 115, Pulse adjustment

Priorities for the individual inputs will be determined dependent on meter constants, transformer ratios and reading constants (refer to the information for the individual registration device).

Energy value weighing:

$$\frac{X_w}{Y_w} = \frac{W}{R \times K} \quad \text{Meter with transformer}$$

$$\frac{X_w}{Y_w} = \frac{I_{np}}{K} \quad \text{Meter without transformer}$$

Volume: $\frac{X_w}{Y_w} = \frac{V_{Inp}}{K}$ e.g. Heat meter

Maximum demand value weighing:

$$\frac{X_p}{Y_p} = \frac{60 \times W}{R \times K \times T_m} \quad \text{Meter with transformer}$$

$$\frac{X_p}{Y_p} = \frac{60 \times I_{np}}{K \times T_m} \quad \text{Meter without transformer}$$

Flow: $\frac{X_p}{Y_p} = \frac{60 \times V_{Inp}}{K \times T_m}$ e.g. Heat meter

X_w, Y_w Energy (Work/Volume): Numerator (X) and denominator (Y), whole numbers, 8 digits

X_p, Y_p Maximum demand (Power/Flow): Numerator (X) and denominator (Y), whole numbers, 8 digits

W Transformer ratio (primary to secondary): $\frac{U_{pri}}{U_{sec}} \times \frac{I_{pri}}{I_{sec}}$

R Meter constant (e.g. pulses/kWh, pulses/m³), can be found on the front plate of the transmitting meter.

K Reading constant

- Inp Impulse constant (e.g. kWh/pulse), can be found on the front plate of the transmitting meter.
- VInp Impulse constant for volume (e.g. m³/pulse), can be found on the front plate of the transmitting meter.
- Tm Registration period (minutes)

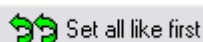
Enter the correct values into the above formulas and reduce the result to the smallest value represented by whole numbers. Then enter the result into the input fields for the relevant input.

Note: The numerator and denominator values can only be entered in whole numbers (without decimals, maximum of 8 digits).

Important: Because the maximum demand values are displayed and stored with **4 digits** (0000 to 9999), it is necessary to define a suitable **reading constant** (K). It is determined by the following table:

Maximum demand (kW, m ³ /h)		Reading constant (K)
1	to 10	0,001 (=1/1000)
10	to 100	0,01 (=1/100)
100	to 1000	0,1 (=1/10)
1000	to 10000	1
10000	to 100000	10
100000	to 1000000	100

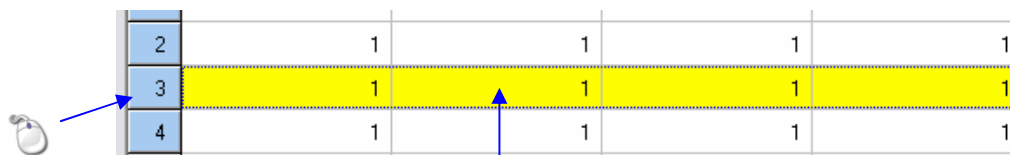
After multiplication of the displayed and stored demand value by the read constant, you obtain the actual demand. The reading constant for the energy values must be preferably set to maximum demand. However user-specific values are also permitted.



Set all like first

Set the values for all inputs like the first input

Select the input for which you want to adjust the pulse adjustment by a click on the left site of the line:



2	1	1	1	1
3	1	1	1	1
4	1	1	1	1

Figure 116, Select an input



Calculate

Possible only if a line is marked. Activate a wizard for calculation of numerator and denominator

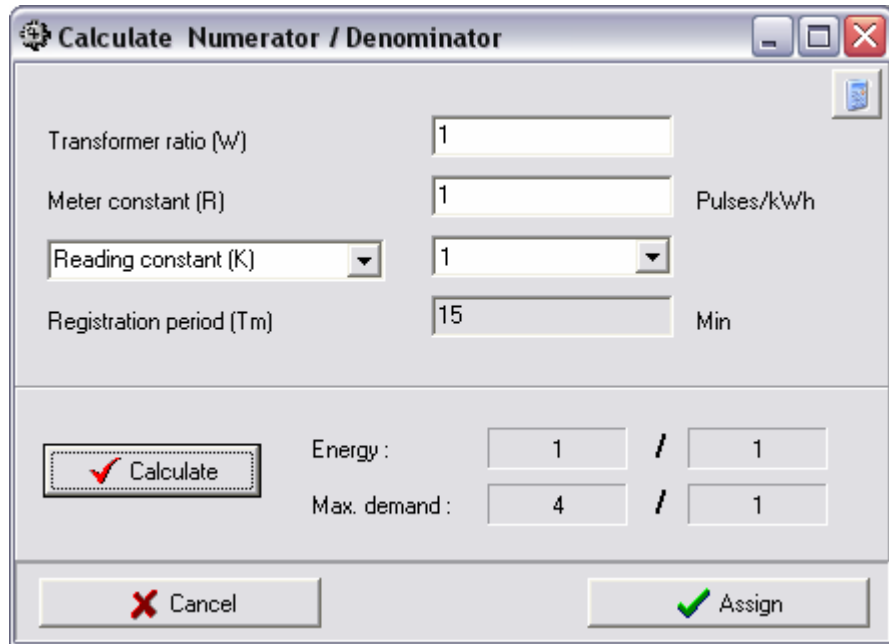
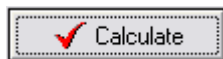


Figure 117, Calculate

Calculate Numerator / Denominator



Calculate the numerator and denominator

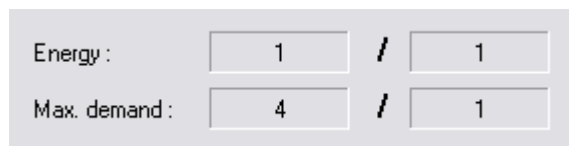
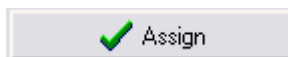


Figure 118, Result



Assign the numerator and denominator



Open MS-Windows calculator.

9.5 Heat meters

Define the parameters for the heat meters:

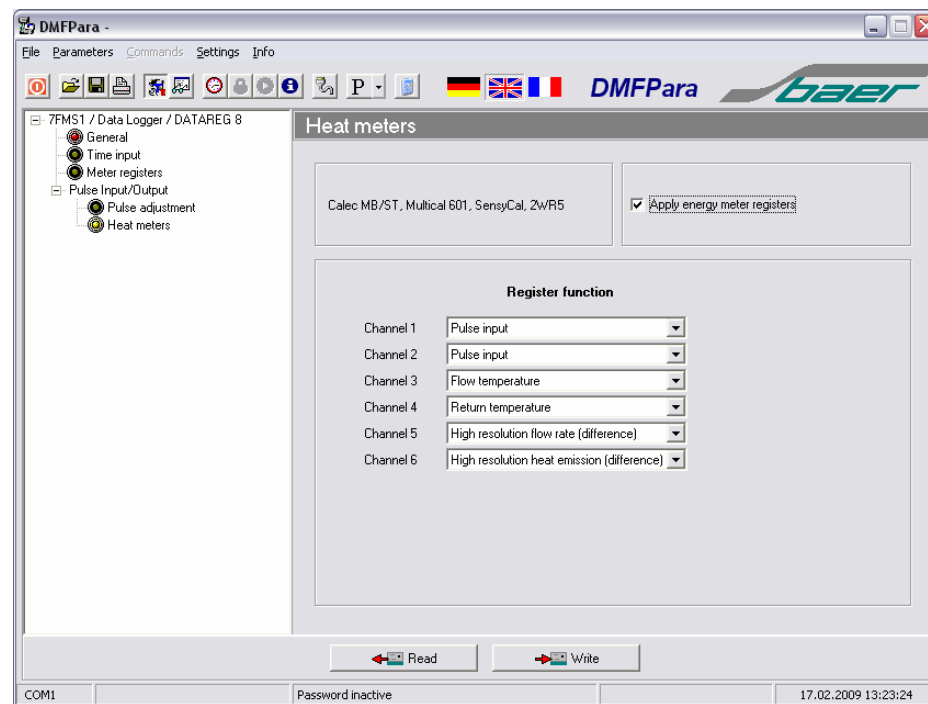


Figure 119, Heat meters

Possible register functions:

- *Pulse input*: Heat meter function disables;
- *Flow temperature*: Heat meter function enables;
average value; reading interval: 10sec.
- *Return temperature*: Heat meter function enables;
average value; reading interval: 10sec.
- *Temperature difference*: Heat meter function enables;
average value; reading interval: 10sec.
- *Instantaneous flow rate (average)*: Heat meter function enables;
average value; reading interval: 10sec.
- *Instantaneous heat emission (average)*: Heat meter function enables;
average value; reading interval: 10sec.
- *High resolution flow rate (difference)*: Heat meter function enables;
difference;
- *High resolution heat emission (difference)*: Heat meter function enables;
difference;

General parameter for heat meters:

- [*Apply energy meter register*](#): Heat meter function enables;
reading of the register value from heat meters: active for flow rate and heat
emission only

9.6 Read device information



Read device information and show a message:

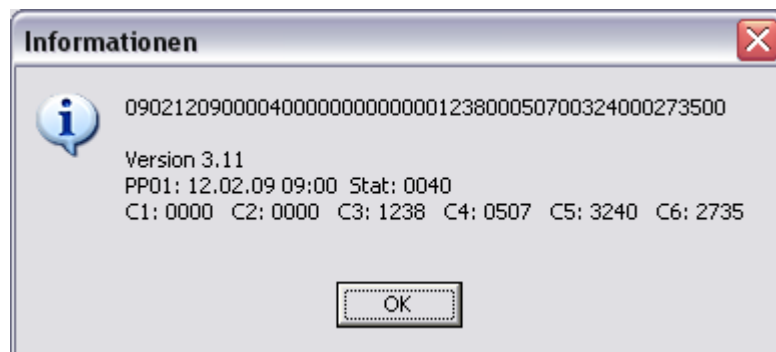


Figure 120, Device information

For access click the title bar in main menu:

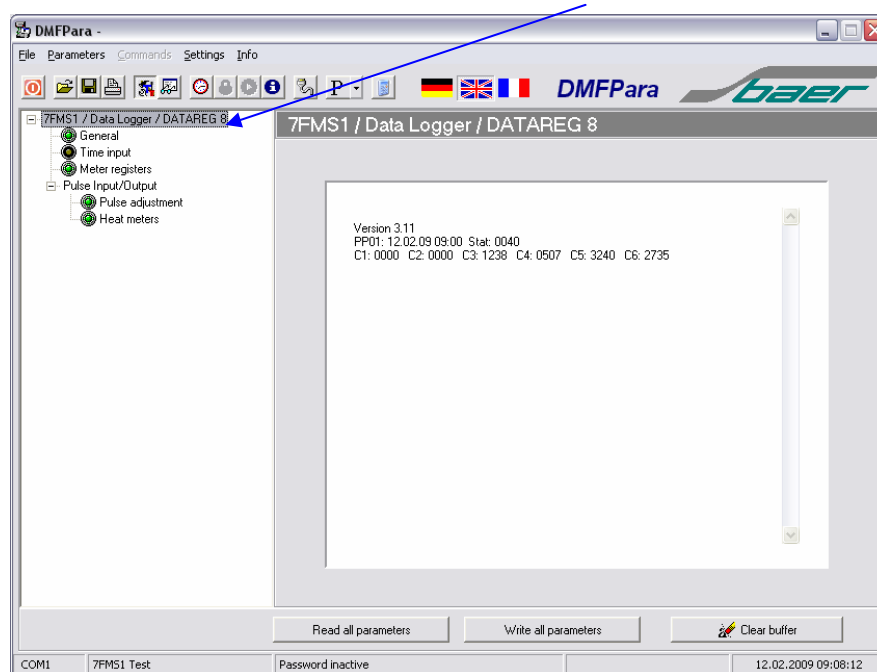


Figure 121, Main menu: device information

10 Menu Info

Information about the program



Figure 122, Info

Appendix A

Register Addresses

1 Notes

1.1 Remarks

Parameter for the Service-Interface: 9600 baud, 8 data bits, 1 stop bit, no parity.

Some of the register addresses listed here may not be available to the software and/or hardware that is in use, because of possible differences from one unit to another. If an attempt is made to access such an address, an error message will appear.

1.2 Meaning of remarks

none Value cannot be changed.

② Value is settable (if the password is activated).

③ Value is programmable (only if the program protection switch is not active; red LED is off).

④ Value is programmable, but NOT while measurements are being performed.

⑤ NOT possible with DLC 32 or DATAREG 32C.

⑥ only restricted possible with DLC 32 or DATAREG 32C.

1.3 Time

Address	Remarks	Description
000 00	②	Current date / time: format - YYYY-MM-DD.hh:mm:ss
010 00		Date/time of the last measuring period 1
030 00		Date/time of the last voltage interruption
031 00		Date/time of the last voltage return
040 00		Date/time of the last reset
040 01 to 040 12		Date/time of the earlier resets (version 1.54 and above)

1.4 Counter value (read out)

Address	Remarks	Description
100 xx	②	Counter value for total energy (xx=00..79) and meter status (status provided only upon request) xx=00..63 : counter value (inputs) xx=64..71 : sums registers - imported xx=72..79 : sums registers - exported
10t xx	②	Counter value reading for tariff 1 - 4 (t=0...3, xx=00..79) and meter status
11t xx		Energy since the last tariff reset <t> (current value)
120 xx		Total demand value at the end of the last measuring period (xx=00..79) and meter status
130 xx		Current total demand value (xx=00..79) and meter status
14t xx		Total energy reading at the end of the last measuring period (t=0) and values for tariff 1 - 4
180 xx	⑤	Average cos(φ) value for the last minute (xx=00..03)
181 xx	⑤	Average cos(φ) value for the last measuring period (xx=00..03)
182 xx	⑤	Lowest average cos(φ) value for one measuring period since the last reset
190 xx	⑤	Master sum

1.5 Pulse conditioning

Parameter for the pulse inputs: for the sub-addresses:

xx = 00..63 := Input 01..64;

Example: 00 := Input 01

Address	Remarks	Description
200 xx	③	Pulse debouncing for input xx (minimum HIGH-phase in values from 2 to 200 in 10ms units)
201 xx	③	Pulse debouncing for input xx (minimum LOW-phase in values from 2 to 200 in 10ms units)
202 xx	③	Maximum pulse HIGH-phase in values from 2 to 200 in 10ms units (0 = monitoring is turned off)
205 xx	③	Activation of input xx
206-xx	③	CALEC-parameters for input xx

Parameters for the sum registers.

The meaning of the value given for the sub-address:

xx = 00..07: energy - positive sums,

xx = 08..15: energy - negative sums,

xx = 16..23: demand - positive sums,

xx = 24..31: demand - negative sums

Address	Remarks	Description
210 xx to 273 xx	③	Order of importance of the telecounter's sums register xx; 210 xx for input 1; 273 xx for input 64
280 xx	③	Hysteresis for sums register xx (available only for energy sums, xx = 00..07)
281 00 to 281 15	③	Energy-sums register output terminal number <subadr>.
281 20 to 281 22	③	Output terminal number from tariff outputs 1 to 3 (version 1.36 and above)
281 30	③	Output terminal number from measuring period output 1 to 3 (version 1.36 and above)
281 31	③	Output terminal number from output RSTA (version 1.55 and above)
287 00	③ ⑤	Cos(φ) Nr. 1: active demand input
287 01	③ ⑤	Cos(φ) Nr. 2: active demand input
287 02	③ ⑤	Cos(φ) Nr. 3: active demand input
287 03	③ ⑤	Cos(φ) Nr. 4: active demand input
288 01	③ ⑤	Cos(φ) Nr. 1: reactive demand input
288 02	③ ⑤	Cos(φ) Nr. 2: reactive demand input
288 03	③ ⑤	Cos(φ) Nr. 3: reactive demand input
288 04	③ ⑤	Cos(φ) Nr. 4: reactive demand input
289 xx	③ ⑤	Integration time for cos(φ) (values from 1 to 60, in minutes)
290 xx	③	HIGH signal duration for output from sum xx, (xx=00..15) (values from 1 to 200 in 10 ms units)
291 xx	③	LOW signal duration for output from sum xx, (xx=00..15) (values from 1 to 200 in 10 ms units)
292 xx	③	Quantization denominator for output xx
300 xx	③	Quantization energy counter / numerator (xx=00..79, see address 100 00)
301 xx	③	Quantization energy counter / denominator (values from 1 to 99999999)
302 xx	③	Quantization demand counter / numerator
303 xx	③	Quantization demand counter / denominator (must be > 0) (values 1 to 99999999)
304 xx	③	Reading constant - energy
305 xx	③	Reading constant - demand
310 00	④	Number of pulse inputs that will be processed by the unit (from 1 to 48)
310 01	④	Number of sums that will be formed: DATAFW4 / DATAREG 48: 0 - 8; and for DLC32 / DATAREG 32C: 0 - 2 or 0 - 4)

Address	Remarks	Description
310 02	④ ⑤	Number of cos(φ)-calculations
310 03	④	Sums difference formation on (=1) or out (=0)
311 00	②	Polarity of MPA (0 = not inverted / 1 = inverted) (version 1.52 and above)
311 01	②	Apply energy meter register from heat meter
311 02	②	Heat meters type
311 03	②	Load prognosis (DIN19244): FCB/FCV invert
311 04	②	Master sum (for power generation only) sum 2 (reactive energy) = function of sum 1 (active energy)
311 05	②	Number of characters for printing
311 06	②	Load prognosis: DIN19244 or IEC60870

1.6 Maximum

Address	Remarks	Description
40t xx		Current maximum value and the time it occurred from demand counter xx for tariff t (t=0..3) For more information's see address 100 00
4nt xx		Maximum value and counter value of resets. n = number of reset (1 := last) t = 0..3 :maximum and the time for tariff t t = 4 :counter value and the energy since the last tariff reset (total value) t = 5..8 :counter value and the energy since the last tariff reset (tariff 1..4) (version 1.54 and above)

1.7 Register

Address	Remarks	Description
600 00	③	Number of digits for each energy counter register
600 01	③	Number of digits for each demand register

1.8 Control in- and outputs

Address	Remarks	Description
640 01	②	Display at resettings
640 02	②	If reset over the keyboard and / or SERVICE is possible
640 03	②	Periodical MD reset
640 04	①	Reading on the internal reset counter
640 05	②	User programmable reset counter (from 1 - 12)
640 06	②	Reset locking (from 1 to 100 measuring periods), only for measuring period 1
640 07	②	RSTX 1 / 2 active
640 08	②	ABL active (version 1.35 and above)
640 09		Number of measuring periods since the last reset
640 10		Number of resets since the start of the measurement
640 11		Reset counter 0..99 (version 1.33 and above)
640 12	①	Input terminal number of RSTX1 (version 1.36 and above)
640 13	①	Input terminal number of RSTX2 (version 1.36 and above)

Address	Remarks	Description
640 14	①	Input terminal number of ABL (version 1.36 and above)
640 15	③	Functionality of RSTA output (version 1.53 and above)
640 16	③	Pulse length for RSTA output (steps of 200 ms) (version 1.53 and above)
641 00	②	SYN input active
641 01	②	SYN limit in seconds
641 02	②	SYN polarity
641 03		Input terminal number of SYN (version 1.36 and above)
642 00	②	Scroll button active (0 = off, 1 = on)
642 01 to 642 50	③	Current address list for the scroll button
642 51	②	Time setting for the scroll button list auto-advance (from 0 to 240 seconds)
642 52		Input terminal number of the scroll list (version 1.36 and above)
643 00	②	Tariff control (on = 1, off = 0)
643 01	②	Tariff control through TRF1/2/3 and MRK (= 0), through internal tariff calendar (= 1) or through external and internal OR-logic bit pattern tariff combinations (= 2).
643 02	②	MRK active (version 1.35 and above)
643 03	④	Number of energy tariffs (values from 0 to 4 or from 0 to 7, dependant on the unit specification)
643 04	④	Number of demand tariffs (values from 0 to 4 or from 0 to 7, dependant on the unit specification)
643 05	②	Mask for the energy tariff (bit pattern: bit 3 = TRF3, 2 = TRF2, 1 = TRF1, 0 = MRK)
643 06	②	Mask for the demand tariff (bit pattern: bit 3 = TRF3, 2 = TRF2, 1 = TRF1, 0 = MRK)
643 10 to 643 25	②	Bit pattern tables for the assignment of current energy tariff calculation for TRF1...3 and MRK
643 10	②	Active when: TRF3=0, TRF2=0, TRF1=0, MRK=0
643 11	②	Active when: TRF3=0, TRF2=0, TRF1=0, MRK=1
643 12	②	Active when: TRF3=0, TRF2=0, TRF1=1, MRK=0
643 13	②	Active when: TRF3=0, TRF2=0, TRF1=1, MRK=1
643 14	②	Active when: TRF3=0, TRF2=1, TRF1=0, MRK=0
643 15	②	Active when: TRF3=0, TRF2=1, TRF1=0, MRK=1
643 16	②	Active when: TRF3=0, TRF2=1, TRF1=1, MRK=0
643 17	②	Active when: TRF3=0, TRF2=1, TRF1=1, MRK=1
643 18	②	Active when: TRF3=1, TRF2=0, TRF1=0, MRK=0
643 19	②	Active when: TRF3=1, TRF2=0, TRF1=0, MRK=1
643 20	②	Active when: TRF3=1, TRF2=0, TRF1=1, MRK=0
643 21	②	Active when: TRF3=1, TRF2=0, TRF1=1, MRK=1
643 22	②	Active when: TRF3=1, TRF2=1, TRF1=0, MRK=0
643 23	②	Active when: TRF3=1, TRF2=1, TRF1=0, MRK=1
643 24	②	Active when: TRF3=1, TRF2=1, TRF1=1, MRK=0
643 25	②	Active when: TRF3=1, TRF2=1, TRF1=1, MRK=1

Address	Remarks	Description
643 30 to 643 45	②	Bit pattern tables for the assignment of current demand tariff calculation for TRF1...3 and MRK
643 30	②	Active when: TRF3=0, TRF2=0, TRF1=0, MRK=0
643 31	②	Active when: TRF3=0, TRF2=0, TRF1=0, MRK=1
643 32	②	Active when: TRF3=0, TRF2=0, TRF1=1, MRK=0
643 33	②	Active when: TRF3=0, TRF2=0, TRF1=1, MRK=1
643 34	②	Active when: TRF3=0, TRF2=1, TRF1=0, MRK=0
643 35	②	Active when: TRF3=0, TRF2=1, TRF1=0, MRK=1
643 36	②	Active when: TRF3=0, TRF2=1, TRF1=1, MRK=0
643 37	②	Active when: TRF3=0, TRF2=1, TRF1=1, MRK=1
643 38	②	Active when: TRF3=1, TRF2=0, TRF1=0, MRK=0
643 39	②	Active when: TRF3=1, TRF2=0, TRF1=0, MRK=1
643 40	②	Active when: TRF3=1, TRF2=0, TRF1=1, MRK=0
643 41	②	Active when: TRF3=1, TRF2=0, TRF1=1, MRK=1
643 42	②	Active when: TRF3=1, TRF2=1, TRF1=0, MRK=0
643 43	②	Active when: TRF3=1, TRF2=1, TRF1=0, MRK=1
643 44	②	Active when: TRF3=1, TRF2=1, TRF1=1, MRK=0
643 45	②	Active when: TRF3=1, TRF2=1, TRF1=1, MRK=1
643 46		Input terminal number of TRF1 (version 1.36 and above)
643 47		Input terminal number of TRF2 (version 1.36 and above)
643 48		Input terminal number of TRF3 (version 1.36 and above)
643 49		Input terminal number of MRK (version 1.36 and above)
644 00	③	MPA active
644 01	③	Active MPA time in units of 200 ms
645 00	②	Logical inputs active
645 01	⑤	Condition of the logical inputs (bit pattern, highest bit links)
645 02 to 645 05	⑤	Input terminal numbers of logical inputs 1 to 4. (version 1.36 and above)
647 00	③	Tariff outputs active
647 01 to 647 64	②	Bit patterns for the tariff outputs (version 1.36 and above)
648 xx	③	Text for scroll-display; xx=00..49
649-00		Current tariff identification byte (version 1.52 and above)
649-01 to 649-64	②	Table for the tariff identification byte for active tariff calendar (version 1.52 and above)
690 00		Momentary conditions of the inputs RSTX1/2, SYN, MRK, ABL, scroll, TRF1/2/3 (32 bit binary)

1.9 Unit information

Address	Remarks	Description
700 00		Unit designation
700 01		Version
700 02		Version date
700 03		Manufacturer
700 04		ROM-identification
700 09		Unit accessories (read out only; programmable at 930 00)
700 10	②	Unit label (16 ASCII-character, programmable)
700 11		Unit status
700 12		Status of the first FC/MSC (identification: "a") in the unit
700 13		Status of the second FC/MSC (identification: "b") in the unit, if so equipped, if not so equipped, the "\$0" will appear in the display
700 14		Status of the third FC/MSC (identification: "c") in the unit, if so equipped, if not so equipped, the "\$0" will appear in the display
700 15		SCTM-status of the first FC/MSC (identification: "a") in the unit
700 16		SCTM-status of the second FC/MSC (identification: "b") in the unit, if so equipped, if not so equipped, the "\$0" will appear in the display
700 17		SCTM-status of the third FC/MSC (identification: "c") in the unit, if so equipped, if not so equipped, the "\$0" will appear in the display
700 19		Printer status
700 20		Current energy tariffs of the four tariff calendars, if the tariff calendars are active, if not active, then four times the tariff value of the tariff inputs
700 21		Current demand tariffs of the four tariff calendars, if the tariff calendars are active, if not active, then four times the tariff value of the tariff inputs
700 22		Status of the measurements
700 30		Information about FC/MSC-card ID "a" (depending on the unit)
700 31		Information about FC/MSC-card ID "b" (depending on the unit)
700 32		Information about FC/MSC-card ID "c" (depending on the unit)

1.10 Time parameters

Address	Remarks	Description
701 00	④	Length of time of MP1 in minutes
702 00	③	The next start time for MP1 (format: YYYY-MM-DD.hh:mm:00, (unless requested at the very start of an MP1)
703 00	③	Length of time remaining in the current MP1
704 xx	②	Table for the start of the summertime switch-over (xx=00..04 for the next 5 cycles) The tables for summertime and wintertime should always be set at the same time
705 xx	②	Table for the start of the wintertime switch-over (xx=00..04 for the next 5 cycles)

1.11 Tariff control

Address	Remarks	Description
707 xx	② ⑥	Assignment of input of summation (energy) to one of the four tariff calendars (see under register address 100 00 for the available specifications)
708 xx	② ⑥	Assignment of input of summation (demand) to one of the four tariff calendars, Values from 0 to 3, default=0 (see under register address 100 00 for the available specifications)
709 xx	② ⑥	Holiday assignments (xx=00..99, 2 X 50); even subaddress = Holiday type; odd subaddresse = date; The Holiday assignments are the same for all of the tariff calendars
710 xx	② ⑥	Starting dates of the six seasons (xx=01..06) from tariff calendar 1 (format: MM-DD.hh:mm)
711 xx	② ⑥	Definitions of the 8 week tariffs within each season (xx=01..06) from tariff calendar 1
712 xx to 726 xx	② ⑥	Day tables (xx=00..14 for the 15 time settings for each das) from Tariff calendar 1; ← For the 15 day settings, along with the corresponding tariffs.
730 xx	② ⑥	Definitions of the seasons (xx=01..06) from tariff calendar 2
731 xx	③ ⑥	Definitions of the 8 week tariffs within each season (xx=01..06) from tariff calendar 2.
732 xx to 746 xx	② ⑥	Day tables (xx=00..14 for the 15 time settings for each das) from Tariff calendar 2; ← For the 15 day settings, along with the corresponding tariffs.
750 xx	② ⑥	Definitions of the seasons (xx=01..06) from tariff calendar 3
751 xx	② ⑥	Definitions of the 8 week tariffs within each season (xx=01..06) from tariff calendar 3.
752 xx to 766 xx	② ⑥	Day tables (xx=00..14 for the 15 time settings for each das) from Tariff calendar 3; ← For the 15 day settings, along with the corresponding tariffs.
770 xx	② ⑥	Definitions of the seasons (xx=01..06) from tariff calendar 4

Address	Remarks	Description
771 xx	② ⑥	Definitions of the 8 week tariffs within each season (xx=01..06) from tariff calendar 4.
772 xx to 786 xx	② ⑥	Day tables (xx=00..14 for the 15 time settings for each das) from Tariff calendar 4; ← For the 15 day settings, along with the corresponding tariffs.

1.12 Communications parameter

Address	Remarks	Description
800 00		Communication on / off
800 01	②	Protocol (version 1.33 and above)
802 00		Number of digits in the outstation number
802 01	②	Unit ID (the first 5 digits are the SCTM outstation number, the first 8 digits are the LSV1 outstation number)
802 02	②	Unit ID for read out of PM 1 ("AAAAAAAAAAAAAAAA" = inactive)
802 03	②	Unit ID for read out of PM 2 ("AAAAAAAAAAAAAAAA" = inactive)
802 09		Length of the data block with TABENQ, TABSET
803 01	②	Data transfer baud rate using the SCTM or LSV1 protocol. With MSC01 - only for the first interface
803 02		Baud rate for the service interface (9600 baud)
803 03	②	Baud rate for load control interface (30-second-data)
803 04	②	Data transfer baud rate using the SCTM or LSV1 protocol. With MSC01 - for the second interface (version 1.49 and above).
804 00		Maximum data block length for SCTM
804 01	②	Number of digits in the demand values being transfered over the SCTM/LSV1 protocol
804 02	④	Periodic buffer 1: energy- or demand values storage (0 = demand, 1 = energy)
804 03	④	Periodic buffer 2: energy- or demand values storage (0 = demand, 1 = energy)
804 05	④	Periodic buffer 1: number of digits in the stored values (4, 6 or 8)
804 06	④	Periodic buffer 2: number of digits in the stored values (4, 6 or 8)
804 08	②	Periodic buffer 1: number of digits in the transmitted values (from 4 to 8)
804 09	②	Periodic buffer 2: number of digits in the transmitted values (from 4 to 8)
804 11	②	Periodic buffer 1: Read out compatibility factor (1 or 100)
804 12	②	Periodic buffer 2: Read out compatibility factor (1 or 100)
804 14	②	Recording of the unit time into the LSV1 telegram
804 15	②	Recording of the tariff ID byte into the SCTM-measurement telegram (version 1.52 and above)
805 00	②	Station address for load control

805 01	②	Number of values transmitted during a load control
806 00 to 806 31	②	Reserve parameter for FC / MSC. This will be forwarded, unchanged, on the FC / MSC (version 1.52 and above)
811 00	②	Receive block time (only in Half duplex modulation) (from 3 to 255 in 10ms units; 0 = Full duplex)
811 01	②	Transmit delay time (only in Half duplex modulation) (from 3 to 255; in 10ms units, 0 = Full duplex)
811 02	②	Modem inactivity time-out (from 10 to 15300, in seconds)
812 00	②	Station address for loadprognosis (version 1.52 and above)

1.13 Periodic buffers

Address	Remarks	Description
821 xx	④	Periodic buffer 1 assignments: bit pattern for the demand register (input terminal 1..48, sum 1..8)
822 xx	④	Periodic buffer 2 assignments: bit pattern for the demand register (input terminal 1..48, sum 1..8)

1.14 Printer

Address	Remarks	Description
861 00	②	Title for list 1
861 01	②	Title for list 2
862 00	②	Printer info text
862 01	②	Print info text at the start of measuring
862 02	②	Print out time schedule for List 1
862 03	②	Print out time schedule for List 2
862 04	②	Print out time schedule for the Reset list
862 05	②	Print out the values from List 1 (with / without counter numbers)
862 07	②	Print out of demand values in List 1 (with / without counter numbers)
862 08	②	Print out of demand values in List 2 (with / without counter numbers)
863 xx	②	Identification text for beginning / end lists, List 1, List 2 and Reset lists to be printed out along with the energy and sums values. The same values for the sub-addresses "xx" are to be used here, as in the Address "100-xx" (version 1.33 and above).
870 00	②	Printer On / Off
871 00	②	List 1: bit pattern for the energy register that is to be printed out (input 1..8)
871 01	②	List 1: bit pattern for the energy register that is to be printed out (input 9..16)
871 02	②	List 1: bit pattern for the energy register that is to be printed out (input 17..24)
871 03	②	List 1: bit pattern for the energy register that is to be printed out (input 25..32)
871 04	②	List 1: bit pattern for the energy register that is to be printed out (input 33..40)
871 05	②	List 1: bit pattern for the energy register that is to be printed out (input 41..48)
871 06	②	List 1: bit pattern for the energy register that is to be printed out (input 49..56)
871 07	②	List 1: bit pattern for the energy register that is to be printed out (input 57..64)
871 08	②	List 1: bit pattern for the energy register that is to be printed out (Sums 1..8, import)
871 09	②	List 1: bit pattern for the energy register that is to be printed out (Sums 1..8, export)
872 00	②	List 1: bit pattern for the demand register that is to be printed out (input 1..8)

Address	Remarks	Description
872 01	②	List 1: bit pattern for the demand register that is to be printed out (input 9..16)
872 02	②	List 1: bit pattern for the demand register that is to be printed out (input 17..24)
872 03	②	List 1: bit pattern for the demand register that is to be printed out (input 25..32)
872 04	②	List 1: bit pattern for the demand register that is to be printed out (input 33..40)
872 05	②	List 1: bit pattern for the demand register that is to be printed out (input 41..48)
872 06	②	List 1: bit pattern for the demand register that is to be printed out (input 49..56)
872 07	②	List 1: bit pattern for the demand register that is to be printed out (input 57..64)
872 08	②	List 1: bit pattern for the demand register that is to be printed out (Sums 1..8, import)
872 09	②	List 1: bit pattern for the demand register that is to be printed out (Sums 1..8, export)
872 10	②	List 1: bit pattern for $\cos(\varphi)$ - value from the last MP (bits 0..3 occupied)
873 00	②	List 2: bit pattern for the energy register that is to be printed out (input 1..8)
873 01	②	List 2: bit pattern for the energy register that is to be printed out (input 9..16)
873 02	②	List 2: bit pattern for the energy register that is to be printed out (input 17..24)
873 03	②	List 2: bit pattern for the energy register that is to be printed out (input 25..32)
873 04	②	List 2: bit pattern for the energy register that is to be printed out (input 33..40)
873 05	②	List 2: bit pattern for the energy register that is to be printed out (input 41..48)
873 06	②	List 2: bit pattern for the energy register that is to be printed out (input 49..56)
873 07	②	List 2: bit pattern for the energy register that is to be printed out (input 57..64)
873 08	②	List 2: bit pattern for the energy register that is to be printed out (Sums 1..8, import)
873 09	②	List 2: bit pattern for the energy register that is to be printed out (Sums 1..8, export)
874 00	②	List 2: bit pattern for the demand register that is to be printed out (input 1..8)
874 01	②	List 2: bit pattern for the demand register that is to be printed out (input 9..16)
874 02	②	List 2: bit pattern for the demand register that is to be printed out (input 17..24)
874 03	②	List 2: bit pattern for the demand register that is to be printed out (input 25..32)
874 04	②	List 2: bit pattern for the demand register that is to be printed out (input 33..40)
874 05	②	List 2: bit pattern for the demand register that is to be printed out (input 41..48)

Address	Remarks	Description
874 06	②	List 2: bit pattern for the demand register that is to be printed out (input 49..56)
874 07	②	List 2: bit pattern for the demand register that is to be printed out (input 57..64)
874 08	②	List 2: bit pattern for the demand register that is to be printed out (Sums 1..8, import)
874 09	②	List 2: bit pattern for the demand register that is to be printed out (Sums 1..8, export)
874 10	②	List 2: bit pattern for $\cos(\varphi)$ - value from the last MP(bits 0..3 occupied)
875 00	②	Print out of the MP1 values: bit pattern for the demand register (input 1..8)
875 01	②	Print out of the MP1 values: bit pattern for the demand register (input 9..16)
875 02	②	Print out of the MP1 values: bit pattern for the demand register (input 17..24)
875 03	②	Print out of the MP1 values: bit pattern for the demand register (input 25..32)
874 04	②	Print out of the MP1 values: bit pattern for the demand register (input 33..40)
875 05	②	Print out of the MP1 values: bit pattern for the demand register (input 41..48)
875 06	②	Print out of the MP1 values: bit pattern for the demand register (input 49..56)
875 07	②	Print out of the MP1 values: bit pattern for the demand register (input 57..64)
875 08	②	Print out of the MP1 values: bit pattern for the demand register (Sums 1..8, import)
875 09	②	Print out of the MP1 values: bit pattern for the demand register (Sums 1..9, export)
876 00	②	Print out of the MP2 values: bit pattern for the demand register (input 1..8)
876 01	②	Print out of the MP2 values: bit pattern for the demand register (input 9..16)
876 02	②	Print out of the MP2 values: bit pattern for the demand register (input 17..24)
876 03	②	Print out of the MP2 values: bit pattern for the demand register (input 25..32)
876 04	②	Print out of the MP2 values: bit pattern for the demand register (input 33..40)
876 05	②	Print out of the MP2 values: bit pattern for the demand register (input 41..48)
876 06	②	Print out of the MP2 values: bit pattern for the demand register (input 49..56)
876 07	②	Print out of the MP2 values: bit pattern for the demand register (input 57..64)
876 08	②	Print out of the MP2 values: bit pattern for the demand register (Sums 1..8, import)
876 09	②	Print out of the MP2 values: bit pattern for the demand register (Sums 1..8, export)
877 00	②	Reset list: bit pattern for print out of the energy flow since the last Reset (input 1..8)

Address	Remarks	Description
877 01	②	Reset list: bit pattern for print out of the energy flow since the last Reset (input 9..16)
877 02	②	Reset list: bit pattern for print out of the energy flow since the last Reset (input 17..24)
877 03	②	Reset list: bit pattern for print out of the energy flow since the last Reset (input 25..32)
877 04	②	Reset list: bit pattern for print out of the energy flow since the last Reset (input 33..40)
877 05	②	Reset list: bit pattern for print out of the energy flow since the last Reset (input 41..48)
877 06	②	Reset list: bit pattern for print out of the energy flow since the last Reset (input 49..56)
877 07	②	Reset list: bit pattern for print out of the energy flow since the last Reset (input 57..64)
877 08	②	Reset list: bit pattern for print out of the energy flow since the last Reset (Sums 1..8, import)
877 09	②	Reset list: bit pattern for print out of the energy flow since the last Reset (Sums 1..8, export)
878 00	②	Reset list: bit pattern for print out of the maximum demand since the last Reset (input 1..8)
878 01	②	Reset list: bit pattern for print out of the maximum demand since the last Reset (input 9..16)
878 02	②	Reset list: bit pattern for print out of the maximum demand since the last Reset (input 17..24)
878 03	②	Reset list: bit pattern for print out of the maximum demand since the last Reset (input 25..32)
878 04	②	Reset list: bit pattern for print out of the maximum demand since the last Reset (input 33..40)
878 05	②	Reset list: bit pattern for print out of the maximum demand since the last Reset (input 41..48)
878 06	②	Reset list: bit pattern for print out of the maximum demand since the last Reset (input 49..56)
878 07	②	Reset list: bit pattern for print out of the maximum demand since the last Reset (input 57..64)
878 08	②	Reset list: bit pattern for print out of the maximum demand since the last Reset (Sums 1..8, import)
878 09	②	Reset list: bit pattern for print out of the maximum demand since the last Reset (Sums 1..8, export)
878 10	②	Reset list: bit pattern for print out of the smallest average $\cos(\varphi)$ value over the MP since the last reset (bits 0..3 occupied)
879 xx	②	Print out of the energy tariff register in the beginning / end lists, List 1, List 2 and Reset lists. One number will be transferred, that will be interpreted as a bit pattern. Bit 0 represents tariff register 1, bit 1 tariff register 2, etc. The tariff register will be printed out when the corresponding bit is "High ("1")". The same values for the sub-addresses "xx" are to be used here, as in the Address "100-xx"
880 xx	②	Print out of the maximum tariff register in the reset list. (see address 879 xx).
881 00	②	List 1: bit pattern for the print out of the energy flow values since the last reset (input 1..8).

Address	Remarks	Description
881 01	②	List 1: bit pattern for the print out of the energy flow values since the last reset (input 9..16)
881 02	②	List 1: bit pattern for the print out of the energy flow values since the last reset (input 17..24)
881 03	②	List 1: bit pattern for the print out of the energy flow values since the last reset (input 25..32)
881 04	②	List 1: bit pattern for the print out of the energy flow values since the last reset (input 33..40)
881 05	②	List 1: bit pattern for the print out of the energy flow values since the last reset (input 41..48)
881 06	②	List 1: bit pattern for the print out of the energy flow values since the last reset (input 49..56)
881 07	②	List 1: bit pattern for the print out of the energy flow values since the last reset (input 57..64)
881 08	②	List 1: bit pattern for the print out of the energy flow values since the last reset (Sums 1..8, import)
881 09	②	List 1: bit pattern for the print out of the energy flow values since the last reset (Sums 1..8, export)
882 00	②	List 2: bit pattern for the print out of the energy flow values since the last reset (input 1..8).
882 01	②	List 2: bit pattern for the print out of the energy flow values since the last reset (input 9..16)
882 02	②	List 2: bit pattern for the print out of the energy flow values since the last reset (input 17..24)
882 03	②	List 2: bit pattern for the print out of the energy flow values since the last reset (input 25..32)
882 04	②	List 2: bit pattern for the print out of the energy flow values since the last reset (input 33..40)
882 05	②	List 2: bit pattern for the print out of the energy flow values since the last reset (input 41..48)
882 06	②	List 2: bit pattern for the print out of the energy flow values since the last reset (input 49..56)
882 07	②	List 2: bit pattern for the print out of the energy flow values since the last reset (input 57..64)
882 08	②	List 2: bit pattern for the print out of the energy flow values since the last reset (input 1..8, import)
882 09	②	List 2: bit pattern for the print out of the energy flow values since the last reset (input 1..8, export)
883 00	②	Reset list: bit pattern for the print out of the energy flow values since the last reset (input 1..8).
883 01	②	Reset list: bit pattern for the print out of the energy flow values since the last reset (input 9..16)
883 02	②	Reset list: bit pattern for the print out of the energy flow values since the last reset (input 17..24)
883 03	②	Reset list: bit pattern for the print out of the energy flow values since the last reset (input 25..32)
883 04	②	Reset list: bit pattern for the print out of the energy flow values since the last reset (input 33..40)
883 05	②	Reset list: bit pattern for the print out of the energy flow values since the last reset (input 41..48)
883 06	②	Reset list: bit pattern for the print out of the energy flow values since the last reset (input 49..56)

Address	Remarks	Description
883 07	②	Reset list: bit pattern for the print out of the energy flow values since the last reset (input 57..64)
883 08	②	Reset list: bit pattern for the print out of the energy flow values since the last reset (Sums 1..8, import)
883 09	②	Reset list: bit pattern for the print out of the energy flow values since the last reset (input 1..8, export)

1.15 Miscellaneous

Address	Remarks	Description
900 00		Whether the last password entry was correct or incorrect
900 01		The last incorrect FC/MSK message (for diagnostic purposes).
900 04		Date / time of the last NAK / time-out from FC/MSK (for diagnostic purposes)
901 00	②	Radio clock reception on / off
901 02	②	Summertime switching on / off
901 03	②	Summertime switching control over the radio clock
901 04	②	Radio clock receiver evaluation on the SYN-input
902 00	②	Language
903 00	②	Password for parametering and program end (only readable when parameters are being set)
903 01	②	Password for maximum-reset
903 02	②	Password for media change
903 03	②	Password for restart system (Factory settings)

